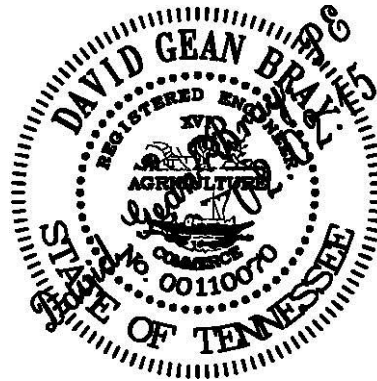
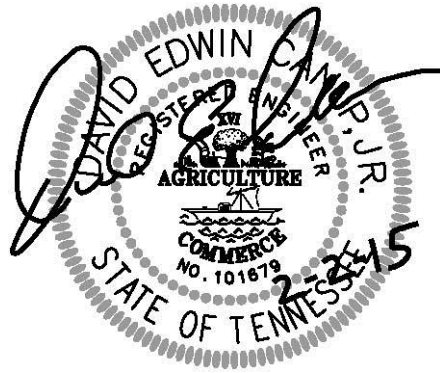


Shelby County Government  
Site Improvements Peggy Edmiston  
Administration Building  
1075 Mullins Station  
Memphis, Tennessee 38134  
February 2, 2015



Canup Engineering, Inc.  
7953 Stage Hills Blvd., Suite 107  
Bartlett, TN 38133

Phone: 901-379-9762  
Fax: 901-379-9763

Bid Set No. \_\_\_\_\_

**SHELBY COUNTY GOVERNMENT  
SITE IMPROVEMENTS PEGGY EDMISTON ADMINISTRATION BUILDING  
1075 MULLINS STATION ROAD MEMPHIS, TN 38134  
CE14-085**

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**END OF DOCUMENT**



# Shelby County Tennessee

Mark Luttrell, Jr., Mayor

## Request for Proposal Shelby County Government Purchasing Department

160 N. Main, Suite 900  
Memphis, TN 38103

*Issued: February 23, 2015*

**Due: March 10, 2015 @ 4:00 p.m. (Central Standard Time)**

**RFP # 15-002-33**

SITE IMPROVEMENTS  
PEGGY EDMISTON ADMINISTRATION BUILDING  
1075 MULLINS STATION ROAD  
STAGE 5

Shelby County Government is soliciting proposals for the provision of Construction Services to provide, Site Improvements, Peggy Edmiston Administration Building, 1075 Mullins Station Road, Memphis, Tennessee 38134, Stage 5. Information regarding this RFP is located on the County's website at [www.shelbycountyttn.gov](http://www.shelbycountyttn.gov). At the top of the home page, click on the links "Department," "P" for the Purchasing Department and "Bids" to locate the name of the above-described RFP. Copies of the project manual and drawing are posted at this location and can be downloaded at no cost to prospective bidders

A **VOLUNTARY** pre-bid conference will be held **Monday, March 2, 2015, at 9:30 A.M., at the Peggy Edmiston Administration Building, Room W-263, Memphis, Tennessee 38134.**

The proposal, as submitted, should include all estimated cost related to the services requested in this RFP. If selected, you will contract with Shelby County Government pending completion of all requirements contained herein. Respondents requesting additional information or clarification are to contact, Nelson Fowler at [nelson.fowler@shelbycountyttn.gov](mailto:nelson.fowler@shelbycountyttn.gov).

Proposals must be received in the office of the Administrator of Purchasing **no later than 4:00 P.M. on Tuesday, March 10, 2015.** Proposals should be addressed to:

**Nelson Fowler, Manager A  
Shelby County Government  
160 N. Main, Suite 900  
Memphis, TN 38103**

The package containing the original proposal four (4) copies and one Digital CD must be sealed and marked with the Proposers name and **“CONFIDENTIAL, “SITE IMPROVEMENTS, PEGGY EDMISTON ADMINISTRATION BUILDING, 1075 MULLINS STATION ROAD, STAGE 5”, RFP # 15-002-33,** noted on the outside.

Sincerely,

Nelson Fowler, Manager A  
Purchasing Department Shelby County Government

CC: Dave Canup, Canup Engineering  
Diep Tran, Support Services

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*Note: Please make sure you pay close attention to Sections: I-V, IX & XI. These sections will clearly outline what information is required to properly respond and prepare your RFP response.*

## **I. INTRODUCTION**

Shelby County Government (the “County”), is seeking proposals from interested and qualified firms to provide, Site Improvements, Peggy Edmiston Administration Building, 1075 Mullins Station Road, Memphis, Tennessee 38134, Stage 5. This Request for Proposal (“RFP”) is being released to invite interested and qualified firms to prepare and submit proposals in accordance with instructions provided where the successful candidate will be selected and invited to enter into a contractual relationship with Shelby County for the Services outlined in this RFP.

## **II. MINIMUM PROPOSER REQUIREMENTS**

All Proposers must:

1. Must submit a Bid Bond in the amount of 5% of their bid. This bond must be submitted with your bid.
2. Have or obtain prior to the execution of the final contract all appropriate licenses and certifications required in the State of Tennessee for the performance of the Services in accordance with the provisions of this RFP.
3. The successful contractor must be able to submit a performance/labor material bond separate bonds each in the amount of 100% of the amount of the contract.
4. Firms located within the boundaries of Shelby County are required to have a current Shelby County Business License or be considered exempt from the license requirement by the Shelby County Clerks Office.
5. Also see Item # I, page 24 for forms to be submitted with your bid.
6. Prime and LOSB contractors must **apply** and **qualify** for an Equal Opportunity Compliance (EOC) certification number through our EOC Administration prior to submitting your response.
7. Independent contractors (sole proprietors) must adhere to State of Tennessee Public Chapter No. 436, know as the “Tennessee Lawful Employment Act (effective date of 1/1/2012). Proof and documentation of employment eligibility must be included with the proposal.

***Please Note: As a part of doing business with Shelby County, each individual, company, or organization is required to obtain an “Equal Opportunity Compliance” certification number prior to submitting your response.***

***You can access the online applications to receive the numbers indicated above at [www.shelbycountyttn.gov](http://www.shelbycountyttn.gov). To obtain a vendor number and an EOC number, please follow the instructions below:***

### **Vendor Number (Purchasing Department)**

At the top of the home page, click on the links “Department”, “P” for the Purchasing Department and “Conducting Business with Shelby County”. The “Vendor Registration” link is at the bottom of the drop down box. Please download the application instructions and read thoroughly prior to accessing the application. (*Applications for a vendor number are accepted online only.*)

### **Equal Opportunity Compliance (EOC) Number (EOC Administration Office)**

At the top of the home page, click on the links “Department”, “E” for the Equal Opportunity Compliance and “Contract Compliance Program”. The “Contract Compliance Packet” link is in the middle of the page. Please print the packet and mail or fax the completed packet to the EOC office. The mailing address is 160 N. Main Street, Suite 200, Memphis, TN 38103. The fax number is 901-222-1101.

**Note: Because of the length of time it takes to apply and receive an EOC number, vendors who apply prior to the RFP due date, bid will be accepted pending EOC approval of their application.**

*If you have any questions regarding the application, you may contact Purchasing at (901)222-2250 or the EOC Administration at (901) 222-1100.*

### **III. CORRESPONDENCE**

**All correspondence, proposals and questions concerning the RFP are to be submitted to:**

**Nelson Fowler, Manager A  
Shelby County Government  
160 N. Main St. Suite 900  
Memphis, TN 38103  
(901) 222-2250**

Respondents requesting additional information or clarification are to contact Nelson Fowler in writing at [nelson.fowler@shelbycountyttn.gov](mailto:nelson.fowler@shelbycountyttn.gov) or at the address listed above. Questions should reference the section of the RFP to which the question pertains and all contact information for the person submitting the questions.

**IN ORDER TO PREVENT AN UNFAIR ADVANTAGE TO ANY RESPONDENT, VERBAL QUESTIONS WILL NOT BE ANSWERED. The deadline for submitting questions will be Thursday, March 5, 2015 at 12:00 p.m.**

**Individual vendor questions will be answered by e-mail as received before the cut-off date. All written questions submitted by the deadline indicated above will be answered and posted on the County’s website at [www.shelbycountyttn.gov](http://www.shelbycountyttn.gov) within forty eight (48) hours of the above cut-off date.**

*Please be aware that contact with any other personnel (other than the person clearly identified in this document) within Shelby County regarding this RFP may disqualify your company from further consideration.*

*These guidelines for communication; have been established to ensure a fair and equitable process for all respondents. Please be aware that contact with any other personnel (other than the person clearly identified in this document) within Shelby County or its benefit administrators regarding this RFP may disqualify your company from further consideration.*

#### **IV. PROPOSAL SUBMISSION DEADLINE**

All proposals must be received at the address listed above no later than **4:00 PM on Tuesday, March 10, 2015**. Facsimile or electronically transmitted proposals will not be accepted since they do not contain original signatures. Postmarks will not be accepted in lieu of actual receipt. Late or incomplete proposals may not be opened and considered. Under no circumstances, regardless of weather conditions, transportation delays, or any other circumstance, will this deadline be extended.

#### **V. PROPOSAL TIMELINE**

Shelby County reserves the right to modify this timeline at any time. If the due date for proposals is changed, all prospective Proposers shall be notified.

Request for Proposals Released	Monday, February 23, 2015
Pre-Bid Conference	Monday, March 2, 2015 at 9:30 AM
Proposal Due Date	4:00 p.m., Tuesday, March 10, 2015
Notification of Award	April 2015

The County may reproduce any of the Proposers proposal and supporting documents for internal use or for any other purpose required by law.

#### **VI. PROPOSAL CONDITIONS**

##### **A. Contingencies**

This RFP does not commit the County to award a contract. The County reserves the right to accept or reject any or all proposals if the County determines it is in the best interest of the County to do so. The County will notify all Proposers, in writing, if the County rejects all proposals.

##### **B. Modifications**

The County reserves the right to issue addenda or amendments to this RFP.

##### **C. Proposal Submission**

To be considered, all proposals must be submitted in the manner set forth in this RFP. It is the Proposers responsibility to ensure that its proposals arrive on or before the specified time.



**D. Incurred Costs**

This RFP does not commit the County to pay any costs incurred in the preparation of a proposal in response to this RFP and Proposers agree that all costs incurred in developing this RFP are the Proposers responsibility.

**E. Final Authority**

The final authority to award a contract rests solely with the Shelby County Purchasing Department.

**F. Proposal Validity.**

Proposals submitted hereunder will be firm for one hundred twenty (120) calendar days from the due date unless otherwise qualified.

**G. LOSB**

**SHELBY COUNTY GOVERNMENT  
LOCALLY OWNED SMALL BUSINESS (LOSb) PROGRAM  
FOR CONSTRUCTION SERVICES**

**SITE IMPROVEMENT  
PEGGY EDMISTON ADMINISTRATION BUILDING  
1075 MULLINS STATION ROAD  
MEMPHIS, TENNESSEE 38134  
STAGE 5**

**General**

Shelby County Government is committed to a policy of non-discrimination pursuant to the Equal Protection provisions of the United States Constitution. It is further the policy of Shelby County that it's purchasing and contracting practices encourage the use of Locally-Owned Small Businesses (LOSb's) in all solicitations. In furtherance of these policy objectives, Shelby County seeks to afford all citizens equal opportunities to do business on county contracts and to ensure that all bidders, proposers, or Contractors doing business with Shelby County provide to LOSb's, maximum practicable opportunities, commensurate with availability, price and capabilities required, to participate on contracts which are paid for, in whole or in part, with monetary appropriations from Shelby County.

Shelby County seeks to prevent discrimination against any person or business in pursuit of these opportunities on the basis of race or gender. Shelby County will conduct its contracting and purchasing programs so as to discourage any discrimination and will actively seek to resolve all

claims of discrimination brought against Shelby County or any Contractors involved in such contracting and purchasing programs.

Shelby County has determined that **20%** of the contract sum will be contracted with LOSB vendors. For assistance and information regarding LOSB participation, Bidders shall contact:

Ms. Carolyn Griffin  
Office of Equal Opportunity Compliance  
Board of Commissioners of Shelby County  
160 North Main Street, Suite 200  
Memphis, Tennessee 38103  
Phone: 901-222-1100  
Fax: 901-222-1101  
E-mail: carolyn.griffin@shelbycountyttn.gov

## **Definitions**

The definitions used in this document are as follows:

1. **“Bidder”** or **“Proposers”** means any person, firm, partnership, association, or joint venture seeking to be awarded a contract or subcontract to provide goods, commodities or services.
2. **“Certification”** or **“Certified”** means a Business that is certified by Shelby County Government under the LOSB program.
3. **“Commercially useful function”** means being responsible for the management and performance of a distinct element of the total work.
4. **“Contractor”** shall mean any person or business enterprise that submits a bid or proposal to provide labor, goods or services to Shelby County by contract for profit in the area of construction or construction-related activities; and, any person or firm who supplies or provides labor, goods or services to Shelby County by contract for profit.
5. **“Efforts to Achieve LOSB Participation”** means that the Contractor will solicit LOSB Participation with respect to the procurement and will consider all sub-bids and quotations received from LOSB’s. When a subcontract is not awarded to the LOSB, the Contractor must document the reason(s) the award was not made and substantiate that documentation in writing pursuant to the provisions of this Program.
6. **“Locally Owned Small Business (LOSB)”** means a business whose home office is located in Shelby County, whose annual revenues do not exceed \$5,000,000 and who has been certified by Shelby County Office of Equal Opportunity Compliance.
7. **“Non-LOSB”** means a business which is not certified as a LOSB.
8. **“Unavailable”** means either that: (1) there is no LOSB providing goods or services requested; or, (2) no LOSB submitted a bid.

## **Requirements and Compliance**

All firms or entities seeking to become Contractors as outlined herein are required to make good faith efforts to achieve LOSB participation when submitting a proposal or bidding on Shelby

County procurements. Bidders and Proposers shall not discriminate on the basis of race or gender when soliciting bids in the performance of Shelby County's procurements. Discrimination complaints brought to the attention of Shelby County Office of Equal Opportunity Compliance (or its designee) will be reviewed and investigated to the extent necessary to determine the validity of such complaints and what actions, if any, should be taken by Shelby County.

## **Policies and Procedures**

Shelby County may adopt policies and procedures as necessary to carry out and implement its powers and duties with regard to the LOSB Program. It is the goal of Shelby County to encourage participation by LOSB's and to adopt rules and regulations which achieve to the greatest extent possible a level of participation by LOSB's taking into account the total number of all Contractors and suppliers. Therefore, Shelby County will review each procurement request to determine the maximum potential for utilization of LOSB's. This review is based on the availability of qualified LOSB's providing goods or services as it relates to the scope of the bid or procurement process. The following procedures may be utilized during the procurement process.

### **1. Pre-Bid Activity**

#### **a. Bid Language**

Shelby County may insert language into each bid specification describing the LOSB Program to assure that all prospective bidders are aware of the requirements to make efforts to utilize LOSB's.

#### **b. Notification**

Shelby County may provide written notification to Contractors and LOSB's regarding: pre-bid conferences; technical assistance to LOSB's; LOSB Program procedures and required documentation; and, provide a list of LOSB's who have expressed an interest in competing for the bid or in performing as a subcontractor.

### **2. Contractor's Responsibilities**

#### **a. Efforts to Achieve LOSB Participation**

All entities seeking to become Contractors are required to make efforts to achieve maximum LOSB participation, as outlined in this LOSB Program, when submitting a response to a bid or negotiated proposal in response to a Shelby County procurement opportunity. Such Efforts should be documented on **LOS Form "A"**.

#### **b. Utilization**

Contractors are required to utilize legitimate LOSB's in order to receive credit for the utilization of a LOSB. Contractors must document all LOSB's to be utilized, the percentage of utilization and the intended scope of work. Such information should be submitted on **LOS Form "B"**. This documentation must be submitted with the bid or negotiated proposal document.

- c. Commercially Useful Functions  
All LOSB's identified on **LOS Form "C"** or **LOS Form "D"** shall perform a Commercially Useful Function.
- d. Unavailability  
If a potential Contractor's efforts to obtain LOSB participation are unsuccessful due to the unavailability of a LOSB, the Contractor will submit a statement of unavailability. **LOS Form "A."**
- e. Pre-Work Conference  
Any Contractor who is the successful bidder shall be required to attend a conference with Shelby County prior to beginning the work. The primary purpose of this conference is to review the project scope and review LOSB participation as outlined in **LOS Form "B"**. Shelby County will also review the Statement of Intent to Perform as a Subcontractor or Provide Supplies or Services as documented on **LOS Form "C"**.
- f. Post-Award Change  
Any Contractor who determines that a LOSB identified on **LOS Form "B"** cannot perform shall request approval from Shelby County to contract with an alternate subcontractor pursuant to this LOSB Program. Such request will be reviewed and approved only after adequate documentation for the proposed change is presented.
- g. LOSB Certification  
Each month the Contractor shall submit **LOS Form "D"** certifying all payments made to LOSB's.

### 3. **LOS Responsibilities**

- a. Commercially Useful Function  
It is the responsibility of each LOSB providing subcontracted goods and/or services to submit **LOS Form "C"** certifying that it is performing the work and that it is a Commercially Useful Function.

### **Written Agreement**

Shelby County policies and procedures on LOSB participation are designed to create contractual relationships between Contractors and LOSB's. Therefore, a Contractor may utilize the services of a LOSB in estimating and satisfying the scope of work, provided that a written contract/agreement is executed between the Contractor and the LOSB.

### **Certification**

To ensure that the ownership and control over decision-making and day-to-day operations of a Certified LOSB is legitimate, Shelby County reserves the right to verify the ownership and control of each LOSB utilized.

### **Monitoring LOSB Utilization**

Shelby County intends to monitor and enforce this LOSB Program. Shelby County reserves the right to conduct random audits of each of its Contractor's LOSB's. Shelby County reserves the right to reevaluate a LOSB's certification at any time.

### **Efforts to Achieve LOSB Participation**

The Contractor shall consider all bids and/or quotations received from LOSB's. When a subcontract is not awarded by a Contractor to any of the competing LOSB's, the Contractor must document the reason(s) the award was not made to the LOSB's. It is the responsibility of the Contractor to prove that it employed Efforts to Achieve LOSB participation. Evidence supporting the Contractor's Efforts must be documented on **LOS Form "A"**, which must include, but is not limited to, the following:

1. Contractor must submit proof that it solicited LOSB participation through reasonable and available means including, but not limited to:
  - a. Written notices to LOSB's who have the capability to perform the work of the contract or provide the service;
  - b. Direct mailing, electronic mailing, facsimile or telephone requests.
2. Contractor must submit proof that it provided interested LOSB's with adequate information about plans, requirements and specifications of the contract in a timely manner to assist them in responding to a solicitation.
3. Contractor must submit proof that it made Efforts to Achieve LOSB Participation including, but not limited to, proof that it made opportunities available to LOSB suppliers and identified opportunities commensurate with opportunities made available and identified to Non LOSB's. Such proof will include the names of businesses, contact person(s), addresses, telephone numbers, and, a description of the specifications for the work selected for subcontracting.
4. Contractor must submit proof that it allowed LOSB's the opportunity to review bid specifications, blue prints and all other bid related items at no charge. The Contractor must allow sufficient time for review prior to the bid deadline.
5. Contractor must submit proof that it made Efforts to Achieve LOSB Participation by not rejecting a LOSB as unqualified or unacceptable without sound reasons based on a thorough investigation of their capabilities. Contractor must submit proof of the basis for rejecting any LOSB deemed unqualified or unacceptable by the Contractor. The Contractor will not impose unrealistic conditions of performance on LOSB's seeking subcontracting opportunities.

The Contractor must fully cooperate with Shelby County in its post-contract award LOSB Program audit and compliance efforts.

### **Substitution of LOSB's after Contract Award**

In order to make a substitution of a LOSB, a Contractor must make a request to Shelby County. This request must be submitted in writing to Shelby County. Shelby County reserves the right to approve any substitution of a LOSB. The Contractor has the responsibility to provide Shelby

County with a reasonable basis for the substitution. If the Contractor desires to substitute the LOSB with a Non-LOSB, then the Contractor must comply with the Effort to Achieve LOSB Participation provisions set forth herein.

### **Noncompliance with LOSB Program**

Any of the following reasons, individually or collectively, may result in suspension from bidding, prohibition from contracting, or cancellation of contracts:

1. The failure to perform according to contract provisions relating to this LOSB Program;
2. Violation of, circumvention of, or failure to comply with the LOSB Program; and/or,
3. Other reasons deemed appropriate by Shelby County.

### **Questions and Information**

Questions regarding this LOSB Program and requests for information should be directed to:

Ms. Carolyn Griffin  
Office of Equal Opportunity Compliance  
Board of Commissioners of Shelby County  
160 North Main Street, Suite 200  
Memphis, Tennessee 38103  
Phone: 901-222-1100  
Fax: 901-222-1101  
E-mail: carolyn.griffin@shelbycountyttn.gov

### **Construction**

This LOSB Program is consistent with Shelby County Policies and Procedures. Wherever conflicts exist, the provision in the Shelby County Policies and Procedures will prevail.

### **LOSB Program Forms Description**

- **LOSB Form A -- Certification of Efforts**

Contractors are required to submit **LOSB Form “A”** with proposals as evidence and documentation of efforts that have been made to contact LOSB’s for participation as subcontractors, joint venture partners or suppliers of goods and services. Contractors are required to contact LOSB’s and solicit quotes for goods and services. All responses to the Contractor’s solicitation should be recorded and reported.

- **LOSB Form B -- LOSB Utilization Plan**

A Contractor is required to submit **LOSB Form “B”** with its Proposal in order to identify all LOSB’s they propose to utilize in providing the goods and services included in the Proposal. Contractors may only include a proposed provider of goods or services on

**LOSB Form “B”**, if the entity is a legitimate LOSB. Additionally, if such entity will provide services, Contractors may only list LOSB’s on **LOSB Form “B”** if the entity will perform a Commercially Useful Function. The Successful Contractor will be required to finalize and submit **LOSB Form “B”** prior to award of a contract. **LOSB Form “B”** will be incorporated into the contract and will become a contractual obligation of the Successful Contractor. **LOSB Form “B”** shall not be changed or altered after award of a contract without approval from Shelby County. The Contractor is required to provide written notice describing the reasons for any proposed change to Shelby County and to obtain approval from Shelby County of any changes to **LOSB Form “B”**.

- **LOSB Form C** –Statement of Intent to Perform as a Subcontractor or Provide Supplies or Services

Contractors are required to have each subcontracted LOSB providing services complete **LOSB Form “C”** certifying that it is performing the work and that it is a Commercially Useful Function.

- **LOSB Form D** – Statement of Payments to LOSB’s

Contractors are required to record and maintain information regarding the utilization of LOSB’s and all other information during the performance of awarded contracts. This information shall be recorded and maintained on **LOSB Form “D”**. The form is required to be submitted to Shelby County each month. **LOSB Form “D”** must be completed in its entirety with information regarding the types of goods purchased from LOSB’s or the types of services rendered by LOSB’s and dollars amounts paid for their goods or services.

**Shelby County  
LOSB Program**

**LOSB FORM A**

**CERTIFICATION OF EFFORTS TO ACHIEVE LOSB PARTICIPATION**

(To Be Submitted with the Bid/Proposal)

**Company Name:** \_\_\_\_\_

**Bid No.:** \_\_\_\_\_

I certify that the following efforts were made to achieve LOSB participation:

		YES	NO
A	Provided written notices to LOSB's who have the capability to perform the work of the contract or provide the service		
B	Direct mailing, electronic mailing, facsimile or telephone requests		
C	Provided interested LOSB's with adequate information about plans, requirements and specifications of the contract in a timely manner to assist them in responding to a solicitation		
D	Allowed LOSB's the opportunity to review bid specifications, blue prints and all other bid/RFP related items at no charge, and allowed sufficient time for review prior to the bid deadline		
E	Acted in good faith with interested LOSB's, and did not reject LOSB's as unqualified or unacceptable without sound reasons based on a thorough investigation of their capabilities		
F	Did not impose unrealistic conditions of performance on LOSB's seeking subcontracting opportunities		

Additionally, I contacted the referenced LOSB's and requested a bid/proposal. The responses I received were as follows:

<b>Name and Address of LOSB</b>	<b>Type of Work And Contract Items, Supplies or Services to be Performed</b>	<b>Response</b>	<b>Reason for Not Accepting Bid/Proposal</b>




*(If additional space is required this form maybe duplicated)*

**If applicable, please complete the following:**

I hereby certify that LOSB's were "Unavailable" as defined in the LOSB Program to submit bids to provide goods and services for this RFP/Bid's purpose.

Reasons for the "Unavailability":

---



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---

Submitted by:

\_\_\_\_\_  
Authorized Representative Signature

\_\_\_\_\_  
Title

\_\_\_\_\_  
Date

**Shelby County  
LOSB Program  
LOSB FORM B**

**LOSB UTILIZATION PLAN**  
(To Be Submitted with the Bid/Proposal)

**Company:** \_\_\_\_\_  
**Bid No.:** \_\_\_\_\_

I, \_\_\_\_\_, do certify that on the following procurement opportunity,

(Contractor)

\_\_\_\_\_, the following LOSB's will be utilized as sub-contractors, suppliers,  
(Opportunity)  
or to provide professional services:

Name	Description of Work	Contract Value	LOSB Number

*(If additional space is needed this form may be duplicated)*

TOTAL CONTRACT VALUE: \_\_\_\_\_

TOTAL % OF LOSB PARTICIPATION: \_\_\_\_\_

*The successful bidder/proposer is required to finalize and submit this form prior to award of a contract. Joint Venture Agreements, partnering agreements and all pertinent information must be presented prior to contract award. This information will be incorporated into the contract and will become a contractual obligation of the successful bidder/proposer. The finalized LOSB Form B shall not be changed or altered after award of a contract without approval from Shelby County. The successful bidder/proposer is required to provide written notice describing the reasons for the change to Shelby County to obtain approval of any changes to LOSB Form B.*

Submitted by:

\_\_\_\_\_  
Authorized Representative Signature

---

Title

---

Date

**Shelby County  
LOSB Program**

**LOSB FORM C**

**STATEMENT OF INTENT TO PERFORM AS A SUBCONTRACTOR OR  
PROVIDE SUPPLIES OR SERVICES  
(To Be Submitted Prior to Contract Award)**

**Company Name:** \_\_\_\_\_

**Bid No.:** \_\_\_\_\_

I, \_\_\_\_\_, intend to provide supplies or services in connection with the  
(Subcontractor/Provider)  
above **bid/proposal** request as a LOSB.

I am prepared to perform a **“Commercially Useful Function”** in connection with the above project.

The following are the work items to be performed:

\_\_\_\_\_  
\_\_\_\_\_

at the following price: \$\_\_\_\_\_.

**If applicable, please complete the following:**

I have or will enter into a formal agreement with \_\_\_\_\_ for the above-  
(Company)  
described scope of work, supplies or services conditioned upon the execution of a contract  
with Shelby County.

I hereby certify that this statement is true and correct:

Business Information: Submitted by:

Business: \_\_\_\_\_  
Authorized Representative (Print)

Address: \_\_\_\_\_  
Title

\_\_\_\_\_  
Authorized Representative's Signature

Phone: \_\_\_\_\_  
Date

Facsimile: \_\_\_\_\_

**Shelby County  
LOSB Program**

**LOSB FORM D**

**STATEMENT OF PAYMENTS TO LOSB'S**  
(To Be Submitted Monthly and with Final Payment Request)

**Company Name:** \_\_\_\_\_

**Name/Contract No.:** \_\_\_\_\_

**Payment Request Number:** \_\_\_\_\_

<b>Name of Firm</b>	<b>Description of work</b>	<b>Total Amount Due This Month</b>	<b>Total Dollars Paid To Date</b>	<b>% of Contract Completed</b>	<b>Start Date of Contract</b>	<b>End Date of Contract</b>

*(If additional space is needed this form may be duplicated)*

I hereby certify that this statement is true and that above payments have been made.

**Business Information:**

**Submitted by:**

**Business:** \_\_\_\_\_

\_\_\_\_\_  
**Authorized Representative (Print)**

**Address:** \_\_\_\_\_

\_\_\_\_\_  
**Title**

**Phone:** \_\_\_\_\_

\_\_\_\_\_  
**Authorized Representative's Signature**

**Facsimile:** \_\_\_\_\_

\_\_\_\_\_  
**Date**

**LOCALLY OWNED SMALL BUSINESS PURCHASING PROGRAM  
RULES AND REGULATIONS:**

(i) The Administrator of Purchasing in conjunction with the Administrator of EOC shall identify certain goods and services required by the County to be set aside for special purchasing procedures for locally owned small businesses.

(ii) Only certified locally owned small businesses will be allowed to submit competitive bids on the goods or services identified under paragraph (i) above.

(iii) The Administrator of Purchasing shall, in conjunction with the Administrator of EOC, annually review the Shelby County Capital Improvement Program to determine those projects with a construction cost of \$250,000 or more. Contracts amounting to at least ten (10%) of the construction costs of such project shall be awarded to locally owned small businesses as defined herein, except as set forth in sub-paragraph (vi) of this section, either as part of the conditions of the solicitation for general contractors bidding on these projects, or as separate bids issued by the County for subcontracts that may be assigned to general contractors.

(iv) After adhering to all other bidding and purchasing requirements of the County, not inconsistent with this part, if no bids are received from locally owned small businesses, then the County may solicit bids for the goods or services from all other sources.

(v) On all purchases and/or contracts entered into by the County, the Purchasing Administrator or his or her designee shall have the right to negotiate with any supplier of goods or services to the County for the inclusion of locally owned small business subcontractors and/or suppliers in the contract award.

(vi) Failure by a supplier or contractor to include locally owned small business sub-contractors or suppliers in its bid or contract may be grounds for rejection of said bid or contract unless the supplier or contractor can show documented evidence of good cause why none were included.

(vii) Any locally owned small business awarded a contract or purchase order under this section shall not sublet, subcontract or assign any work or services awarded to it without the prior written consent of the Mayor or the Purchasing Administrator.

(viii) As to those purchases below the requirement for a formal bid solicitation (currently, under \$15,000) and not included in the locally owned small business set aside, the Administrator of Purchasing shall determine if any locally owned small business offers that product or service. If so, at least one such eligible locally owned small business should be included in the vendors

contacted for an opportunity to bid, and the Administrator of Purchasing may, at his discretion, designate in a purchase order the purchase of such goods and services from the identified locally owned small business.

(ix) In those situations where a locally owned small business as defined herein, engages in open competitive bidding for County contracts, the Administrator of Purchasing shall provide for a preference for the locally owned small business where responsibility and quality are equal. Said preferences shall not exceed five percent (5%) of the lowest possible bidder meeting specifications. The preference shall be applied on a sliding scale in the following manner:

- a. A preference of up to five percent (5%) shall be allowed for contracts up to \$500,000.00;
- b. A preference of up to three and five-tenths percent (3.5%) shall be allowed for contracts up to \$750,000.00;
- c. A preference of two and one-half percent (2.5%) shall be allowed for contracts up to \$1,000,000.00;
- d. A preference of two percent (2%) shall be allowed for contracts that exceed \$1,000,000.00.

(x) For construction contracts over \$2,000,000.00, the Administrator of Purchasing shall provide for a preference of two percent (2%) to general contractors meeting the requirements of Section 1, Subparagraph B, if fifty percent (50%) or more of the total work comprising the bid has been or will be awarded to certified locally owned small businesses. The fifty percent subcontracting threshold must be met prior to contract execution.

(xi) The Administrator of Purchasing may divide a single bid package for any purchase of goods and services into two or more smaller bid packages in any case that the Administrator of Purchasing reasonably believes that the smaller bid packages will result in a greater number of bids by locally owned small businesses.

(xii) The Administrator of Purchasing, upon approval of the County Mayor, may establish special insurance and bonding requirements for certified locally owned small businesses so long as they are not in conflict with the laws of the State of Tennessee.

(xiii) The Administrator of Purchasing, with the approval of the County Mayor, shall adopt and promulgate, and may from time to time, amend rules and regulations not inconsistent with the provisions of this ordinance, governing the purchase of goods and services from locally owned small business concerns to effectuate and implement the Locally Owned Small Business

Purchasing Program within the intent of this ordinance.

(xiv) The Administrator of EOC shall, in conjunction with the Administrator of Purchasing, provide a written quarterly report to the Mayor and Board of Commissioners which shall include a summary of the purchases selected for this program, a listing of the contracts awarded to locally owned small businesses for the period, and the dollar amounts of each such contract, and the percentage which such contracts bear to the total amount of purchases for the period.



**H. DRUG-FREE WORKPLACE AFFIDAVIT**

**STATE OF** \_\_\_\_\_

**COUNTY OF** \_\_\_\_\_

The undersigned, principal officer of \_\_\_\_\_, an employer of five (5) or more employees contracting with \_\_\_\_\_ County government to provide construction services, here states under oath as follows:

1. The undersigned is a principal officer of \_\_\_\_\_ (hereinafter referred to as the "Company"), and is duly authorized to execute this Affidavit on behalf of the Company.
2. The Company submits this Affidavit pursuant to T.C.A. § 50-9-113, which requires each employer with no less than five (5) employees receiving pay who contracts with the state or any local government to provide construction services to submit an affidavit stating that such employer has a drug-free workplace program that complies with Title 50, Chapter 9, of the *Tennessee Code Annotated*.
3. The Company is in compliance with T.C.A. § 50-9-113. Further affiant saith not.

Principal Officer

STATE OF \_\_\_\_\_

COUNTY OF \_\_\_\_\_

Before me personally appeared \_\_\_\_\_ with whom I am personally acquainted (or proved to me on the basis of satisfactory evidence), and who acknowledged that such person executed the foregoing affidavit for the purposes therein contained.

Witness my hand and seal at office this \_\_\_\_\_ day of \_\_\_\_\_ 20

Notary Public

My commission expires:

**I. FORMS TO BE SUBMITTED**

**LOSB FORM A: MUST BE COMPLETED AND SUBMITTED IN YOUR BID ENVELOPE**

**LOSB FORM B: MUST BE COMPLETED, SUBMITTED WITH YOUR BID DOCUMENTING ALL LOSB'S TO BE UTILIZED, THE PERCENTAGE OF UTILIZATION AND THE INTENDED SCOPE OF THE WORK.**

**LOSB FORM C- MUST BE COMPLETED AND SUBMITTED BY EACH LOSB PROVIDING SUBCONTRACTED GOODS AND OR SERVICES CERTIFYING THAT THEY ARE PERFORMING THE WORK AND THAT IT IS A COMMERCIALY USEFUL FUNCTION.**

**LOSB FORM D-MUST BE COMPLETED AND SUBMITTED BY THE SUCCESSFUL CONTRACTOR EACH MONTH CERTIFYING ALL PAYMENTS MADE TO LOSB'S.**

**DRUG FREE WORKPLACE AFFIDAVIT-MUST IS COMPLETED AND SUBMITTED WITH YOUR BID.**

**BID BOND- ALL BIDS MUST BE ACCOMPANIED BY A BANK CERTIFIED CHECK OF BANK DRAFT, LETTER OF CREDIT ISSUED BY ANY NATIONAL BANK OR APPROVED BID BOND FOR NOT LESS THAN 5% (PERCENT) OF THE AMOUNT OF THE BID. ALL PROPOSAL GUARANTEES SHALL BE MADE OUT TO THE COUNTY OF SHELBY.**

**NOTE: LOSB FORM C AND D WILL BE SUBMITTED BY THE SUCCESSFUL CONTRACTOR.**

**FAILURE TO SUBMIT THE REQUIRED FORMS MAY RESULT IN YOUR BID BEING REJECTED AS BEING IN NON-COMPLIANCE WITH BID REQUIREMENTS.**

## **VII. GENERAL REQUIREMENTS**

### **A. Scope of Contract**

The County wishes to engage in a contractual relationship with the lowest responsive Contractor selected through a low bid process.

### **B. Time Frame**

The successful Contractor will complete all obligations and conditions included in this RFP to be eligible provide these services within ten (10) business days of receipt of the Notice of Award. Failure to complete these obligations and conditions and formalize the contractual agreement will result in cancellation of the award.

### **C. Reservation of Rights**

The County reserves the right, for any reason to accept or reject any one or more proposals, to modify any part of the RFP, or to issue a new RFP.

## **VIII. AWARD OF CONTRACT**

Proposers are advised that the lowest responsive proposal will be awarded the contract.

## **IX. GRATUITY DISCLOSURE FORM**

**INSTRUCTIONS:** This form is for all persons receiving any Shelby County Government contract, land use approval or financial grant money to report any gratuity that has been given, directly or indirectly, to any elected official, employee or appointee (including their spouses and immediate family members) who is involved in the decision regarding the contract, land use approval, or financial grant of money. Please note that the information listed on this statement is subject to being posted on the Shelby County Government's website.

**1. NAME**

---

**2. DATE OF GRATUITY**

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**3. NATURE AND PURPOSE OF THE GRATUITY**

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**4. NAME OF THE OFFICIAL, EMPLOYEE, APPOINTEE, OR FAMILY MEMBER WHO RECEIVED THE GRATUITY**

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**5. NAME OF THE PERSON OR ENTITY THAT PROVIDED THE GRATUITY**

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**6. ADDRESS OF THE PERSON OR ENTITY THAT PROVIDED THE GRATUITY**

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**7. DESCRIPTION OF THE GRATUITY**

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**8. COST OF THE GRATUITY (If cost is unknown and not reasonably discernible by the person giving the gratuity, then the person giving the gratuity shall report a good faith estimate of the cost of the gratuity.)**

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**9. AFFIDAVIT**

The information contained in this Gratuity Disclosure Form, and any supporting documentation or materials referenced herein or submitted herewith, is true and correct to the best of my knowledge, information and belief and affirm that I have not given, directly or indirectly, any gratuity to any elected official, employee or appointee (including spouse and immediate family members) that has not been disclosed and I affirm that I have not violated the provisions of the Shelby County Government Code of Ethics.

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
Print Name

Sworn to and subscribed before me this \_\_\_\_\_ day of \_\_\_\_\_ in \_\_\_\_\_ County, Tennessee:

\_\_\_\_\_  
Signature of Notary

**Affix Notary Seal Here**

\_\_\_\_\_  
Notary Registration No.

## **X. NOTICE TO BIDDERS**

1. **THIS IS NOT A PUBLIC BID OPENINGS:**

Sealed bids for the improvements described herein will be received at, **THE OFFICE OF THE SHELBY COUNTY ADMINISTRATOR OF PURCHASING, SUITE 900, SHELBY COUNTY ADMINISTRATION BUILDING, 160 NORTH MAIN, MEMPHIS, TENNESSEE 38103, until TUESDAY, MARCH 10, 2015 at 4:00 P.M.**

2. **Description of Work:**

- (a) The proposed work is officially known as: **SITE IMPROVEMENTS, PEGGY EDMISTON ADMINISTRATION BUILDING, 1075 MULLINS STATION ROAD, MEMPHIS, TENNESSEE 38134, STAGE 5.**

3. **Pre-Bid Meeting:**

All interested bidders must attend a **VOLUNTARY** pre-bid meeting to be held on **Monday, March 2, 2015 @ 9:30 A.M. at the Peggy Edmiston Administration Building, Room W-263, Memphis, Tennessee 38134.**

4. **Instruction to Bidders:**

- (a) Information regarding this RFP is located on the County's website at [www.shelbycountyttn.gov](http://www.shelbycountyttn.gov). At the top of the home page, click on the links "Department," "P" for the Purchasing Department and "Bids" to locate the name of the above-described RFP. Copies of the project manual and drawing are posted at this location and can be downloaded at no cost to prospective bidders
- (b) All bids must be accompanied by a bank cashier's check or bank draft, letter of credit issued by any national bank or certificate of deposit therein, duly assigned, or certified check or approved bid bond for not less than (5) percent of the amount of the bid. All proposal guarantees shall be made out to the COUNTY OF SHELBY.
- (c) The successful bidder must be licensed by the Tennessee State Board of Licensing General Contractors before execution of the contract. Evidence of this license must be submitted to the purchasing department by submitting the RFP number, Contractor's name, license number, expiration date thereof, and license classification of the contractor(s) bidding for the prime contract and for the electrical, plumbing, heating, ventilation and air conditioning subcontracts in accordance with TCA 62-6-119. Lacking all of this information, the bid shall be rejected and the bid bond will be forfeited.

5. EOC Requirements

- (a) As a condition precedent to bidding, **Prime Contractors** and **LOSB Contractors** must have received a current “Equal Opportunity Compliance Eligibility Number” and Vendors Number prior to the submission of their bid which must be attached to each bid submission. To receive an E.O.C. Eligibility Number, specific information must be received by the E.O.C. Department at least 48 hours prior to the bid opening. To verify your E.O.C. Number or to receive information for obtaining a number, contact the E.O.C. Department, 222-1100. Information regarding a vendors number please contact Nelson Fowler, Shelby County Purchasing at 901-222-2250.
- (b) Use of Locally Owned Small Business (LOSB) participation on this County project is required.
- (c) Bidders are encouraged to contact County-Certified LOSB firms from our LOSB listing that can be obtained from our EOC department. Please call Carolyn Griffin at 901-222-1100 for a listing of current LOSB contractors. Bidders may also provide the names of firms they believe would qualify as LOSB firms, by notifying the E.O.C. Department and filing the required forms at least five (5) working days prior to the bid opening. Bidders choosing to utilize non-certified subcontractors may submit their bid with the understanding that they must provide certification documents to the E.O.C. department within five (5) days after the bid opening in order to be considered for contract award.
- (d) A Locally Owned Small Business is defined as a sole proprietorship, corporation, partnership, or joint venture located within Shelby County and at least 51% owned, operated and managed by a Shelby County resident and having an average annual sale of \$5,000,000.00 or less over the past three (3) years.

6. Rejection of Bids:

The COUNTY OF SHELBY reserves the right to reject any and all proposals and to waive technicalities in any proposal.

BY ORDER OF:

CLIFTON DAVIS

PURCHASING ADMINISTRATOR  
SHELBY COUNTY GOVERNMENT

\_\_\_\_\_, 2015

**SHELBY COUNTY GOVERNMENT  
SITE IMPROVEMENTS PEGGY EDMISTON ADMINISTRATION BUILDING  
1075 MULLINS STATION ROAD  
MEMPHIS, TN 38134**

**RFP 15-002-33**

(Submit As Your Bid)

In compliance with your Invitation for Bids for:

**SHELBY COUNTY SITE IMPROVEMENTS, MULLINS STATION CAMPUS**

Project Location:        Mullins Station Road  
                                 Memphis, TN 38134

The undersigned bidder: (Check one)

- ☐ A corporation organized and existing under Tennessee laws:
- ☐ A partnership consisting of \_\_\_\_\_;
- ☐ An individual trading as \_\_\_\_\_;

of the city of \_\_\_\_\_ having examined the attached Contract Documents and being fully advised as to the extent and character of the work to be performed, and the equipment to be furnished, proposes to furnish and pay for all labor, tools, material, utility fees, federal, state and local taxes and equipment necessary for implementation of the contract requirements.

The bid amounts shall incorporate an allowance for unidentified work as a contingency. Contingency funds may only be applied toward work that is not identified by the contract documents and is approved by the Owner. Any unused funds will be deducted from the contract by deductive change order at contract close-out. The following contingency amounts are incorporated in the Bid amounts:

Base Bid = \$10,000.00 contingency

The undersigned further proposes to perform all work and furnish and pay for all equipment in accordance with the Project Manual and Contract stipulations thereof, with the limit specified, for the following lump sum price if any or all are awarded by the Owner: Enter "NO BID" if you are not offering a Bid on a specific package(s).

**Base-Bid Amount – Site Lighting and Parking Improvements**

in figures \$ \_\_\_\_\_

in words \_\_\_\_\_

**Additive Alternate No. 1 – Bid Amount – New Lighting in north parking area**

in figures \$ \_\_\_\_\_

in words \_\_\_\_\_

**Additive Alternate No. 2– Bid Amount – New Building Lighting ( Fixture type "J").**

in figures \$ \_\_\_\_\_



**SHELBY COUNTY GOVERNMENT  
SITE IMPROVEMENTS PEGGY EDMISTON ADMINISTRATION BUILDING  
1075 MULLINS STATION ROAD  
MEMPHIS, TN 38134**

in words \_\_\_\_\_

**Additive Alternate No. 3– Bid Amount – Building N Parking Lot Lighting.**

in figures \$ \_\_\_\_\_

in words \_\_\_\_\_

**Additive Alternate No. 4 – Bid Amount – New Wireless Lighting Controls**

in figures \$ \_\_\_\_\_

in words \_\_\_\_\_

The Bidder agrees that if he is awarded this Contract, he will commence construction within 14 calendar days after receipt of signed contract and will be substantially complete with all work in 120 days from the date that a Notice To Proceed is issued and liquidated damages are applied for each day after the 120 days.

The Bidder agrees that all request for extensions of time shall be in writing and that only such extensions of time as are granted by the Owner in writing shall be considered in computing that total Contract time. Owner furnished equipment will be available to the Contractor when the notice to proceed is issued.

Should the Contractor neglect, refuse, or fail to complete the work to be done under the Contract within the time herein specified, after all extension of time granted by the Owner have been added, then in that event the Owner shall have and is hereby given the right to deduct and retain out of such monies which may then be due, or which may become due and payable to the Contractor for the work to be done under this Contract, an agreed upon sum equal to Three Hundred Dollars (\$300.00) per calendar day for each and every day that the work is delayed in its completion beyond the specified milestone and substantial completion time. The said \$300.00 per day shall be held by the Owner under a mutual understanding between the Contractor, Contractor's Surety and the Owner. If necessary the Owner shall collect any monies directly from the Contractor or the Contractor's Surety.

Enclosed herewith is a (Certified Check) (Cashier's Check) or a solvent bank (Bidder's Bond) in the amount of \_\_\_\_\_ DOLLARS (\$ \_\_\_\_\_), Made payable to the Owner as a guarantee of good faith and which the undersigned hereby agrees shall be retained as liquidated damages by the Owner should the Contractor fail to furnish a Performance Bond written by good solvent in a surety company doing business in the State of Tennessee and acceptable to the Owner. The Performance Bond shall be in a amount equal to the gross amount of said Contract, and the Performance Bond shall be made and contract shall be signed within 1 week after date of Notice To Proceed from the Owner of award of Contract, and the check shall be returned to the undersigned upon the signing of the Contract and delivery of the required number of copies of approved Performance Bond to the Owner.

**SHELBY COUNTY GOVERNMENT  
SITE IMPROVEMENTS PEGGY EDMISTON ADMINISTRATION BUILDING  
1075 MULLINS STATION ROAD  
MEMPHIS, TN 38134**

In submitting this bid, it is understood that the right is reserved by the Owner to reject any and all bids and it is understood that this bid may not be withdrawn for a period of 120 days after the scheduled time for receipt of bids.

The undersigned declares that \_\_\_\_\_ is the only person, firm or corporation interested in this proposal, and that no other person, firm, or corporation than the one herein named has any interest herein or in the Contract proposed to be taken; that it is made without any connection with any person, firm or corporation making proposal for the same work, and that it is in all respects fair as to the work bid upon and without collusion or fraud; also that no officer or employee of Shelby County Government who is exclude by law from participating therein, is directly or indirectly interested herein, or in furnishing of the supplies or doing the work to which it relates, or in furnishing surety, or in any portion of the profits thereof.

Receipt of the following addenda is hereby acknowledged: \_\_\_\_\_.  
(Insert numbers of all addenda received; if no addenda received, insert "None").

Bidder \_\_\_\_\_  
Signature Printed Name  
\_\_\_\_\_  
Business Address

Full name and residence of all persons interested in the foregoing as principle are:

\_\_\_\_\_  
(Name) (Address)

\_\_\_\_\_  
(Name) (Address)

\_\_\_\_\_  
(Name of President if a Corporation) (Name of Secretary if a Corporation)

END OF SECTION

## **SECTION 01100 - SUMMARY**

### **PART 1 - GENERAL**

#### **1.1 SUMMARY**

##### **A. Section Includes:**

1. Project information.
2. Work covered by Contract Documents.
3. Access to site.
4. Coordination with occupants.
5. Work restrictions.
6. Specification and drawing conventions.
7. Miscellaneous provisions.

##### **B. Related Requirements:**

1. Division 1 Section "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.

#### **1.2 PROJECT INFORMATION**

##### **A. Project Identification: Site Improvements**

1. Project Location: Mullins Station Campus, Memphis TN 38134.

##### **B. Owner: Shelby County Government.**

##### **C. Engineer: Canup Engineering, Inc., 7953 Stage Hills Blvd., Suite 107, Bartlett, TN 38133**

#### **1.3 WORK COVERED BY CONTRACT DOCUMENTS**

##### **A. The Work of Project is defined by the Contract Documents and consists of the following:**

1. Install new site lighting and associated wiring, conduit and pull boxes.
2. Modify existing parking area and sidewalk.

##### **B. Type of Contract.**

1. Lump sum.

#### 1.4 ACCESS TO SITE

- A. General: Contractor shall have full use of Project site for construction operations during construction period. Contractor's use of Project site is limited only by Owner's right to perform work or to retain other contractors on portions of Project.
- B. Use of Site: Limit use of Project site to areas within the Contract limits. Do not disturb portions of Project site beyond areas in which the Work is indicated.
  - 1. Driveways, Walkways and Entrances: Keep driveways, loading areas, and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.
    - a. Schedule deliveries to minimize use of driveways and entrances by construction operations.
    - b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.
- C. Condition of Existing Building: Maintain portions of existing building affected by construction operations in a weathertight condition throughout construction period. Repair damage caused by construction operations.

#### 1.5 COORDINATION WITH OCCUPANTS

- A. Full Owner Occupancy: Owner will occupy site and adjacent building(s) during entire construction period. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's day-to-day operations. Maintain existing exits unless otherwise indicated.
  - 1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Owner and approval of authorities having jurisdiction.
  - 2. Notify Owner not less than 72 hours in advance of activities that will affect Owner's operations.

#### 1.6 WORK RESTRICTIONS

- A. Work Restrictions, General: Comply with restrictions on construction operations.
  - 1. Comply with limitations on use of public streets and with other requirements of authorities having jurisdiction.
- B. On-Site Work Hours: Limit work in the existing building to normal business working hours of 7 a.m. to 5 p.m., Monday through Friday, unless otherwise indicated.
- C. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after providing temporary utility services according to requirements indicated:

1. Notify Owner not less than two days in advance of proposed utility interruptions.
  2. Obtain Owner's written permission before proceeding with utility interruptions.
- D. Noise, Vibration, and Odors: Coordinate operations that may result in high levels of noise and vibration, odors, or other disruption to Owner occupancy with Owner.
1. Notify Owner not less than two days in advance of proposed disruptive operations.
  2. Obtain Owner's written permission before proceeding with disruptive operations.
- E. Nonsmoking Building: Smoking is not permitted within the building or within 25 feet of entrances, operable windows, or outdoor-air intakes.

#### 1.7 SPECIFICATION AND DRAWING CONVENTIONS

- A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
  2. Specification requirements are to be performed by Contractor unless specifically stated otherwise.
- B. Division 1 General Requirements: Requirements of Sections in Division 1 apply to the Work of all Sections in the Specifications.
- C. Drawing Coordination: Requirements for materials and products identified on Drawings are described in detail in the Specifications. One or more of the following are used on Drawings to identify materials and products:
1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
  2. Abbreviations: Materials and products are identified by abbreviations published as part of the U.S. National CAD Standard and scheduled on Drawings.
  3. Keynoting: Materials and products are identified by reference keynotes referencing Specification Section numbers found in this Project Manual.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

### END OF SECTION 01100

## **SECTION 01330 - SUBMITTAL PROCEDURES**

### **PART 1 - GENERAL**

#### **1.1 SUMMARY**

- A. Section includes requirements for the submittal schedule and administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.

#### **1.2 DEFINITIONS**

- A. Action Submittals: Written and graphic information and physical samples that require Engineer's responsive action.
- B. Informational Submittals: Written and graphic information and physical samples that do not require Engineer's responsive action. Submittals may be rejected for not complying with requirements.

#### **1.3 SUBMITTAL ADMINISTRATIVE REQUIREMENTS**

- A. Engineer's Digital Data Files: Electronic copies of digital data files of the Contract Drawings will be available by Engineer for Contractor's use in preparing submittals.
- B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
  - 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
  - 2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
    - a. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- C. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Engineer's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
  - 1. Initial Review: Allow 15 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Engineer will advise Contractor when a submittal being processed must be delayed for coordination.
  - 2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.

3. Resubmittal Review: Allow 15 days for review of each resubmittal.
- D. Paper Submittals: Place a permanent label or title block on each submittal item for identification.
1. Indicate name of firm or entity that prepared each submittal on label or title block.
  2. Provide a space approximately 6 by 8 inches on label or beside title block to record Contractor's review and approval markings and action taken by Engineer.
  3. Include the following information for processing and recording action taken:
    - a. Project name.
    - b. Date.
    - c. Name of Engineer.
    - d. Name of Contractor.
    - e. Name of subcontractor.
    - f. Name of supplier.
    - g. Name of manufacturer.
    - h. Submittal number or other unique identifier, including revision identifier.
      - 1) Submittal number shall use Specification Section number followed by a decimal point and then a sequential number (e.g., 06100.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., 06100.01.A).
- i. Number and title of appropriate Specification Section.
  - j. Drawing number and detail references, as appropriate.
  - k. Location(s) where product is to be installed, as appropriate.
  - l. Other necessary identification.
4. Additional Paper Copies: Unless additional copies are required for final submittal, and unless Engineer observes noncompliance with provisions in the Contract Documents, initial submittal may serve as final submittal.
5. Transmittal for Paper Submittals: Assemble each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Engineer will discard submittals received from sources other than Contractor.
- E. Options: Identify options requiring selection by Engineer.
- F. Deviations: Identify deviations from the Contract Documents on submittals.
- G. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
1. Note date and content of previous submittal.
  2. Note date and content of revision in label or title block and clearly indicate extent of revision.
  3. Resubmit submittals until they are marked with approval notation from Engineer action stamp.

- H. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- I. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Engineer's action stamp.

## PART 2 - PRODUCTS

### 2.1 SUBMITTAL PROCEDURES

#### A. General Submittal Procedure Requirements:

- 1. Action Submittals: Submit five paper copies of each submittal unless otherwise indicated. Engineer will return four copies.
- 2. Informational Submittals: Submit one paper copies of each submittal unless otherwise indicated. Engineer will not return copies.

#### B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.

- 1. If information must be specially prepared for submittal because standard published data are not suitable for use, submit as Shop Drawings, not as Product Data.
- 2. Mark each copy of each submittal to show which products and options are applicable.
- 3. Include the following information, as applicable:
  - a. Manufacturer's catalog cuts.
  - b. Manufacturer's product specifications.
  - c. Standard color charts.
  - d. Statement of compliance with specified referenced standards.
  - e. Testing by recognized testing agency.
  - f. Application of testing agency labels and seals.
  - g. Notation of coordination requirements.
  - h. Availability and delivery time information.
- 4. For equipment, include the following in addition to the above, as applicable:
  - a. Wiring diagrams showing factory-installed wiring.
  - b. Printed performance curves.
  - c. Operational range diagrams.
  - d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.
- 5. Submit Product Data before or concurrent with Samples.
- 6. Submit Product Data in the following format:
  - a. Five paper copies of Product Data unless otherwise indicated. Engineer will return four copies.



- C. Closeout Submittals and Maintenance Material Submittals: Comply with requirements specified in Division 1 Section "Closeout Procedures."
- D. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
- E. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.

### PART 3 - EXECUTION

#### 3.1 CONTRACTOR'S REVIEW

- A. Action and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Engineer.
- B. Project Closeout and Maintenance Material Submittals: See requirements in Division 1 Section "Closeout Procedures."
- C. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

#### 3.2 ENGINEER'S ACTION

- A. General: Engineer will not review submittals that do not bear Contractor's approval stamp and will return them without action.
- B. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.
- C. Submittals not required by the Contract Documents may not be reviewed and may be discarded.

**END OF SECTION 01330**

## **SECTION 01500 - TEMPORARY FACILITIES AND CONTROLS**

### **PART 1 - GENERAL**

#### **1.1 SUMMARY**

- A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.
- B. Related Requirements:
  - 1. Division 1 Section "Summary" for limitations on work restrictions and utility interruptions.

#### **1.2 USE CHARGES**

- A. General: Installation and removal of and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated.
- B. Water Service from Existing System: Water from Owner's existing water system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.
- C. Electric Power Service from Existing System: Electric power from Owner's existing system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

#### **1.3 QUALITY ASSURANCE**

- A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.
- B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

#### **1.4 PROJECT CONDITIONS**

- A. Temporary Use of Permanent Facilities: Engage Installer of each permanent service to assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

## PART 2 - PRODUCTS

### 2.1 TEMPORARY FACILITIES

- A. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations.

### 2.2 EQUIPMENT

- A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.

## PART 3 - EXECUTION

### 3.1 INSTALLATION, GENERAL

- A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.
  - 1. Locate facilities to limit site disturbance as specified in Division 1 Section "Summary."
- B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

### 3.2 TEMPORARY UTILITY INSTALLATION

- A. General: Install temporary service or connect to existing service.
  - 1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.
- B. Water Service: Connect to Owner's existing water service facilities. Clean and maintain water service facilities in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.
- C. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with requirements of authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.
- D. Electric Power Service: Connect to Owner's existing electric power service. Maintain equipment in a condition acceptable to Owner.

### 3.3 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.
- B. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.
- C. Temporary Erosion and Sedimentation Control: Comply with requirements of 2003 EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent.
- D. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.

### 3.4 OPERATION, TERMINATION, AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Maintenance: Maintain facilities in good operating condition until removal.

**END OF SECTION 01500**

## **SECTION 01770 - CLOSEOUT PROCEDURES**

### **PART 1 - GENERAL**

#### **1.1 SUMMARY**

- A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
  - 1. Substantial Completion procedures.
  - 2. Final completion procedures.
  - 3. Warranties.
  - 4. Final cleaning.
  - 5. Repair of the Work.
- B. Related Requirements:
  - 1. Division 1 Section "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.
  - 2. Division 1 Section "Operation and Maintenance Data" for operation and maintenance manual requirements.
  - 3. Division 1 Section "Demonstration and Training" for requirements for instructing Owner's personnel.
  - 4. Divisions 2 through 16 Sections for specific closeout and special cleaning requirements for the Work in those Sections.

#### **1.2 ACTION SUBMITTALS**

- A. Contractor's List of Incomplete Items: Initial submittal at Substantial Completion.
- B. Certified List of Incomplete Items: Final submittal at Final Completion.

#### **1.3 CLOSEOUT SUBMITTALS**

- A. Certificates of Release: From authorities having jurisdiction.
- B. Certificate of Insurance: For continuing coverage.
- C. Field Report: For pest control inspection.

#### **1.4 MAINTENANCE MATERIAL SUBMITTALS**

- A. Schedule of Maintenance Material Items: For maintenance material submittal items specified in other Sections.

## 1.5 SUBSTANTIAL COMPLETION PROCEDURES

- A. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's punch list), indicating the value of each item on the list and reasons why the Work is incomplete.
- B. Submittals Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
  - 1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
  - 2. Submit closeout submittals specified in other Division 1 Sections, including project record documents, operation and maintenance manuals, final completion construction photographic documentation, damage or settlement surveys, property surveys, and similar final record information.
  - 3. Submit closeout submittals specified in individual Divisions 2 through 16 Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
  - 4. Submit maintenance material submittals specified in individual Divisions 2 through 16 Sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by Engineer. Label with manufacturer's name and model number where applicable.
- C. Procedures Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
  - 1. Advise Owner of pending insurance changeover requirements.
  - 2. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
  - 3. Complete startup and testing of systems and equipment.
  - 4. Perform preventive maintenance on equipment used prior to Substantial Completion.
  - 5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit demonstration and training video recordings specified in Division 1 Section "Demonstration and Training."
  - 6. Advise Owner of changeover in heat and other utilities.
  - 7. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
  - 8. Complete final cleaning requirements, including touchup painting.
  - 9. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.
- D. Inspection: Submit a written request for inspection to determine Substantial Completion a minimum of 10 days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Engineer will either proceed with inspection or notify Contractor of unfulfilled requirements. Engineer will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
2. Results of completed inspection will form the basis of requirements for final completion.

#### 1.6 FINAL COMPLETION PROCEDURES

- A. Preliminary Procedures: Before requesting final inspection for determining final completion, complete the following:
  1. Submit a final Application for Payment according to Division 1 Section "Payment Procedures."
  2. Certified List of Incomplete Items: Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
  3. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.
  4. Submit pest-control final inspection report and warranty.
  5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.
- B. Inspection: Submit a written request for final inspection to determine acceptance. On receipt of request, Engineer will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
  1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

#### 1.7 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

- A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction

#### 1.8 SUBMITTAL OF PROJECT WARRANTIES

- A. Time of Submittal: Submit written warranties on request of Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated, or when delay in submittal of warranties might limit Owner's rights under warranty.
- B. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.
  1. Bind warranties and bonds in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch.

2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
  3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.
  4. Warranty Electronic File: Scan warranties and bonds and assemble complete warranty and bond submittal package into a single indexed electronic PDF file with links enabling navigation to each item. Provide bookmarked table of contents at beginning of document.
- C. Provide additional copies of each warranty to include in operation and maintenance manuals.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

## PART 3 - EXECUTION

### 3.1 FINAL CLEANING

- A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
  1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a designated portion of Project:
    - a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
    - b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
    - c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
    - d. Remove tools, construction equipment, machinery, and surplus material from Project site.



- e. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
- f. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
- g. Sweep concrete floors broom clean in unoccupied spaces.
- h. Remove labels that are not permanent.
- i. Wipe surfaces of mechanical and electrical equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
- j. Leave Project clean and ready for occupancy.

### 3.2 REPAIR OF THE WORK

- A. Complete repair and restoration operations before requesting inspection for determination of Substantial Completion.
- B. Repair or remove and replace defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.
  - 1. Touch up and otherwise repair and restore marred or exposed finishes and surfaces. Replace finishes and surfaces that already show evidence of repair or restoration.
    - a. Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates. Remove paint applied to required labels and identification.
  - 2. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.
  - 3. Replace burned-out bulbs, bulbs noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.

**END OF SECTION 01770**

## **SECTION 01781 - PROJECT RECORD DOCUMENTS**

### **PART 1 - GENERAL**

#### **1.1 SUMMARY**

- A. Section includes administrative and procedural requirements for project record documents, including the following:
  - 1. Record Drawings.
  - 2. Record Specifications.
  - 3. Record Product Data.
- B. Related Requirements:
  - 1. Division 1 Section "Operation and Maintenance Data" for operation and maintenance manual requirements.
  - 2. Divisions 2 through 16 Sections for specific requirements for project record documents of the Work in those Sections.

#### **1.2 CLOSEOUT SUBMITTALS**

- A. Record Drawings: Comply with the following:
  - 1. Number of Copies: Submit one set(s) of marked-up record prints.

### **PART 2 - PRODUCTS**

#### **2.1 RECORD DRAWINGS**

- A. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised Drawings as modifications are issued.
  - 1. Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.
    - a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
    - b. Record data as soon as possible after obtaining it.
    - c. Record and check the markup before enclosing concealed installations.

2. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
  3. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
  4. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
- B. Format: Identify and date each record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.

## PART 3 - EXECUTION

### 3.1 RECORDING AND MAINTENANCE

- A. Recording: Maintain one copy of each submittal during the construction period for project record document purposes. Post changes and revisions to project record documents as they occur; do not wait until end of Project.

**END OF SECTION 01781**

## **SECTION 01820 - DEMONSTRATION AND TRAINING**

### **PART 1 - GENERAL**

#### **1.1 SUMMARY**

- A. Section includes administrative and procedural requirements for instructing Owner's personnel, including the following:
  - 1. Demonstration of operation of systems, subsystems, and equipment.
  - 2. Training in operation and maintenance of systems, subsystems, and equipment.
  - 3. Demonstration and training video recordings.

#### **1.2 CLOSEOUT SUBMITTALS**

- A. Demonstration and Training Video Recordings: Submit two copies within seven days of end of each training module.
  - 1. At completion of training, submit complete training manual(s) for Owner's use prepared and bound in format matching operation and maintenance manuals.

#### **1.3 COORDINATION**

- A. Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations and to ensure availability of Owner's personnel.
- B. Coordinate content of training modules with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data has been reviewed and approved by Architect.

### **PART 2 - PRODUCTS**

### **PART 3 - EXECUTION**

#### **3.1 PREPARATION**

- A. Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a training manual organized in coordination with requirements in Division 1 Section "Operations and Maintenance Data."

#### **3.2 INSTRUCTION**

- 1. Owner will furnish Contractor with names and positions of participants.

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- B. Scheduling: Provide instruction at mutually agreed on times. For equipment that requires seasonal operation, provide similar instruction at start of each season.

- 1. Schedule training with Owner with at least seven days' advance notice.

- C. Training Location and Reference Material: Conduct training on-site in the completed and fully operational facility using the actual equipment in-place. Conduct training using final operation and maintenance data submittals.

### 3.3 DEMONSTRATION AND TRAINING VIDEO RECORDINGS

- A. Video Recording Format: Provide high-quality color video recordings with menu navigation in format acceptable to Architect.

**END OF SECTION 01820**

## **SECTION 02741 - Flexible Pavement - Asphaltic Concrete Surface**

### **PART 1 – SCOPE**

This work shall consist of an asphaltic concrete pavement constructed in one or more layers for surface course(s) and binder course(s). The binder course may also be used as a leveling or bushing course. Binder course shall consist of a hot mixture of aggregate and asphalt prepared in a hot bituminous mixing plant. The binder course shall be constructed on a prepared subgrade, subbase, or base conforming to the lines, grades, thicknesses, and cross-sections shown on the Plans or as directed by the Engineer. The surface course shall consist of an asphaltic concrete pavement composed of a mixture of coarse aggregate, fine aggregate, mineral filler, and asphalt cement, constructed on a prepared roadbed in conformity with the lines, grades, thicknesses, and cross-sections shown on the Plans or directed by the Owner.

### **PART 2 – MATERIALS AND EQUIPMENT**

#### **2.01 MATERIALS**

- A. Asphalt Cement. Asphalt cement shall conform to the requirements of AASHTO M 226, Table 2, for the grade specified. Unless otherwise directed, asphalt shall be Viscosity Grade AC-20.
- B. Course Aggregate. Course aggregate (aggregate retained on the No. 4 sieve) shall be crushed stone meeting the quality requirements of ASTM D 692 with the following exceptions:
  - 1. Crushed limestone shall have a sodium sulfate soundness loss not exceeding 9 percent.
  - 2. For Mix No. 1, material retained on the No. 4 sieve shall have a maximum of 20 percent elongated pieces (length greater than five times the average thicknesses).
  - 3. For Mix No. 2, the aggregate shall contain no more than 5 percent soft or nondurable particles.
- C. Fine Aggregate. The fine aggregate shall consist of natural sand consisting of hard, clean, tough grains which will have a maximum loss of 12 percent when subjected to the sodium sulfate soundness test.
- D. Composition of Mixtures.
  - 1. Asphaltic Concrete Surface, Mix No. 1, shall be laid in one course to the thickness shown on the Plans.
  - 2. Asphaltic Concrete Binder, Mix No. 2, shall be laid in one or more courses to the thicknesses shown on the Plans. Mix No. 2 may also be used as a leveling course or bushing course.
  - 3. The composition of the mixes shall be as follows:

### Total Percent Passing by Weight

Sieve Size	Mix No. 1	Mix No. 2
2"	100	100
1-1/2"	100	100
3/4"	100	100
3/8"	76 - 96	65 - 95
No. 4	51 - 76	45 - 70
No. 8	36 - 60	25 - 50
No. 30	16 - 40	12 - 30
No. 100	3 - 12	2 - 12
No. 200	2 - 8	1 - 6

4. The proportions of the total mixture, in percent by weight, shall be as follows:

	Combined Mineral Aggregate	Asphalt Cement
Courses		
Mix No. 1, Surface	92.0 – 96.0	4.0 – 8.0
Mix No. 2, Binder	93.0 – 97.5	2.5 – 7.0

5. It is the intent of this Section of the Specifications that the above described mixes shall conform to the following mixtures specified in the Tennessee Department of Transportation Standard Specifications for Road and Bridge construction.  
 Mix No. 1 – Section 411, Asphaltic Concrete Surface (Hot Mix), Aggregate Grading E.  
 Mix No. 2 – Section 307, Bituminous Plant Mix Base (Hot Mix), Aggregate Grading C.
6. For multiple layer construction, succeeding layers shall not be laid until the previous layer has cooled sufficiently to support the construction equipment
7. When Mix No. 1 is to be used as a surface for traffic lanes, the mineral aggregate shall be composed of not less than 50 percent nor more than 55 percent crushed limestone and not more than 50 percent nor less than 45 percent natural sand. When Mix No. 1 is used for surfacing of shoulders or other non-traffic lane construction, the mineral aggregate may be composed entirely of limestone, including screening and manufactured sand, but in no case shall the mineral aggregate for this construction consist of less than 50 percent limestone. The natural sand shall be so graded that not more than 5 percent will be retained on the No.4 sieve.

## 2.02 EQUIPMENT

All equipment necessary for the satisfactory performance of this construction shall be on the Project and approved before work will be permitted to begin.

### **PART 3 – CONSTRUCTION REQUIREMENTS**

#### **3.01 PREPARATION OF BASE OR EXISTING SURFACE**

The designated surface upon which asphalt concrete courses are to be placed shall be thoroughly cleaned of all dirt and other foreign or loose matter prior to the application of the Tack Coat or Prime Coat.

#### **3.02 THICKNESS AND SURFACE REQUIREMENTS**

Thickness shall be controlled during the spreading operations by frequent measurements taken of freshly spread mixture to establish a relationship between the uncompacted and compacted material. This thickness shall remain in conformity with that specified on the Plans.

**END OF SECTION 02741**



## **SECTION 02760 PAVEMENT MARKINGS**

### **PART 1 - SCOPE**

1.01 Pavement markings are painted markings applied parking areas for delineating parking spaces and ADA loading/unloading areas. The work covered by this section shall consist of furnishing and supplying pavement markings in accordance with these Specifications and the latest revision of the Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD) published by the Tennessee Department of Transportation and in conformity with the lines, dimensions, patterns, locations, and details shown on the Plans or established by the Owner.

1.02 This Section describes the general and specific requirements for conventional marking paint.

### **PART 2 - MATERIALS AND EQUIPMENT**

#### **2.01 MATERIALS**

##### **A. Conventional Reflective Pavement Marking Paint (Type "A" Paint).**

This describes the general and specific requirements for reflective pavement marking paints to be used. This covers ready mixed paint products of spraying consistency suitable for use as reflecting pavement markings on Portland cement concrete or asphaltic concrete pavements. The paint type relative to drying time hereinafter shall be referred to as conventional paint – over 3 minutes drying time.

##### **1. General Properties.**

###### **a. Condition and Stability.**

The paint shall be homogeneous, shall be well ground to a uniform and smooth consistency and shall not skin or settle badly, nor cake, liver, thicken, curdle or gel in the container. The paint shall be capable of being broken up and mixed without difficulty by use of a paddle and shall show the desired characteristics at any time within a period of 6 months from the date of delivery. The paint shall be tested in accordance with ASTM D 869 and D1309 and a paint rated below six (6) shall be considered unsatisfactory.

###### **b. Foreign Matter.**

The paint shall be free from skins, dirt and other foreign matter and shall not contain more than 1 percent water. The paint shall be tested in accordance with methods 4081, 4091 and 4092 of Federal Test Method No. 141.

###### **c. Suitability to Application.**

The paint shall be suited to application by means of spray type pavement marking equipment.

###### **d. Viscosity.**

The conventional paint, as received, shall have a consistency determined on the Stormer Viscosimeter and expressed as Krebs Units at 770 of 70-80 K.U. Any paint which changes consistency within six months after receipt so that the consistency falls outside the viscosity limits stated above shall be considered to have failed this requirement.

###### **e. Color.**

The paint shall visually match the Federal Highway Administration color tolerance chart for standard highway yellow or white.

**END OF SECTION 02760**

## **SECTION 02775 PORTLAND CEMENT CONCRETE SIDEWALKS AND DRIVEWAYS**

### **PART 1 – SCOPE**

1.01 This work shall consist of constructing sidewalks, wheelchair ramps, and driveways of portland cement concrete on a prepared subgrade, in accordance with these Specifications and in conformity with the lines, grades, and typical cross-sections shown on the Plans or directed by the Owner. Wheelchair ramps and commercial and residential driveways shall be constructed in accordance with the Design Standards.

### **PART 2 – MATERIALS AND EQUIPMENT**

#### **2.01 MATERIALS**

- A. Concrete Materials: Concrete materials shall meet the requirements of Specification Section 03050, Portland Cement Concrete for Class A concrete, City of Memphis.
- B. Curing Materials: Curing materials shall conform to the applicable provisions of Specification Section 02750 Paragraph 2.01 C, City of Memphis.
- C. Preformed Joint Fillers: Preformed joint fillers shall be of the bituminous type and shall conform to the requirements of AASHTO M 213 and shall not be more than 1 inch or less than 1/2 inch in thickness. Their width shall be at least equal to the full thickness of the slab, and their length shall be sufficient to eliminate any splicing.

#### **2.02 EQUIPMENT**

- A. Forms shall be of wood, metal, or other suitable material and shall be true to line, free from warp, and of sufficient strength to resist springing out of shape during placing, consolidating, and finishing the concrete. Curved forms of proper radius or flexible forms acceptable to the Owner shall be used on all radial sections.
- B. Satisfactory floats, templates, straightedges, edgers, spades, tamps, and all other equipment necessary for the satisfactory performance of this construction shall be on the Project and approved before work will be permitted to begin.

### **PART 3 – CONSTRUCTION REQUIREMENTS**

#### **3.01 SUBGRADE PREPARATION**

Subgrade preparation for sidewalks and driveways shall be made to the required configuration to conform to the slab thicknesses shown on the Plans.

#### **3.02 FORMS**

Forms shall be well staked or otherwise held to the established lines and grades, and their grade shall be such that finished sidewalks shall have one-quarter of an inch per foot fall toward the curb for drainage unless shown otherwise on the Plans or directed by the Owner. Driveway forms shall be of such width and slope that the finished driveway will conform to the slope of the adjacent sidewalk, grass plot, parking lot, or drive.

#### **3.03 JOINTS**

- A. Unless otherwise indicated on the Plans or directed by the Owner, preformed expansion joint filler, 1/2 inch in thickness, shall be placed in sidewalks at the locations of and in line with expansion joints in the adjoining pavement, curb, or curb and gutter, but at spacings not to exceed 25 feet. When expansion joints have not been installed in the adjoining pavement or

gutter, a 1/2 inch preformed expansion joint filler shall be placed transversely at intervals of not over 25 feet. Preformed expansion joint filler shall be placed at all abutting concrete such as driveways, buildings, or walls. Transverse expansion joints with 1/2 inch preformed expansion joint filler shall be placed to match existing joints in abutting facilities but not to exceed 25 feet between joints. Preformed expansion joint filler shall be placed at each intersection of sidewalk and street curb, longitudinally between sidewalks and street curb, and at such other points as may be shown on the Plans or directed by the Owner. Preformed expansion joint filler, 1 inch in thickness, shall be placed around all appurtenances such as manholes, valve, utility poles, fire hydrants, and signs extending into or through the sidewalk or driveway area, forming an isolated square or rectangular slab around the appurtenance with a minimum of 4 inches clearance of the appurtenance.

- B. The surface of sidewalks shall be divided into blocks by use of a grooving tool. The grooves shall be spaced approximately 5 feet apart and the blocks shall be rectangular unless otherwise ordered by the Owner. The grooves shall be cut to a depth of 1/2 inch. The edges of the grooves shall be edged with an edging tool having a radius of 1/4 inch.
- C. Expansion joint filler material shall not be placed at sidewalk drains. Driveway joints shall be placed as shown on the Design Standards.

### 3.04 PLACING AND FINISHING CONCRETE

- A. Concrete shall be placed only on a moist subgrade and shall not be placed unless the ambient temperature is 35o F and rising. In no case shall concrete be placed on a frozen or frosty subgrade. After the concrete is placed in the forms, it shall be spaded along the forms (including cross forms for joints), tamped, and struck off in an approved manner to required section and grade and shall be finished with floats and straightedges until the surface requirements have been obtained. When the surface of the concrete is free from water and just before the concrete obtains its initial set, it shall be finished with a wooden float and swept lightly at right angles to the street centerline to produce a sandy texture. The longitudinal surface variations shall not be more than 1/4 inch under a 12 foot straightedge nor more than 1/8 inch on a 5 foot transverse section, or as approved by the Owner.
- B. The edges of sidewalks and driveways shall be carefully finished and rounded with an edging tool have a 1/2 inch radius. An edge having a 1/4 inch radius shall be placed adjacent to and on both sides of all intermediate transverse expansion joints in sidewalks, and all marks caused by the edging tool shall be removed with a wetted brush or wooden float. The top of all expansion joint material shall be cleaned of all concrete, and the expansion joint material shall be trimmed if necessary as to be left slightly below the surface of the concrete.

### 3.05 TESTING CONCRETE

Concrete for sidewalks and driveways shall be tested by test specimens made and cured in accordance with AASHTO Designation T 23. The frequency and specific test method will be determined by the Owner. The Contractor shall furnish the concrete necessary for casting test specimens in the field.

### 3.06 CURING AND PROTECTION

- A. Curing and cold weather protection shall be performed as provided for under Specification Section 02750 Paragraph 3.11 "Curing", City of Memphis
- B. Forms may be removed and the slab backfilled at any time that removal will not damage the concrete. Pedestrians will not be allowed upon sidewalks or driveways until 72 hours after finishing the concrete, and no vehicles or loads shall be permitted on any sidewalk or driveway until the Owner has determined that the concrete has attained sufficient strength for such loads. The Contractor shall construct and place such barricades and protection devices as are

necessary to protect the concrete. Any sidewalk or driveway damaged prior to final acceptance of the work shall be removed within joint or groove limits and replaced with concrete of the type and finish of the original construction.

### 3.07 WHEELCHAIR RAMPS

Wheelchair ramps shall be installed at each intersection at locations as reflected in the Design Standards or as directed by the Owner.

### 3.08 THICKNESS

Thickness of sidewalks and driveways shall be as shown on the Plans and Design Standards. Where a washed surface is specified for the concrete surface, and additional 1/2 inch thickness is required over that for the above specified finish.

**END OF SECTION 02775**

## **SECTION 02950 REMOVAL AND REPLACEMENT OF PAVEMENTS AND INCIDENTALS**

### **PART 1 – SCOPE**

This Work shall consist of the removal and replacement of pavements, sidewalks, driveway aprons, curbs and gutters, driveways, paved areas, and curbs.

### **PART 2 – MATERIALS AND EQUIPMENT**

#### **2.01 MATERIALS**

- A. Concrete: Concrete materials shall meet the requirements of Specification Section 03050, Portland Cement Concrete for Class A concrete.
- B. Curing Material: Curing materials shall conform to the applicable provisions of Specification Section 02750 Paragraph 2.01 C, City of Memphis
- C. Asphaltic Concrete Wearing Surface and Asphalt Curb: Asphaltic concrete wearing surfaces and asphalt curb shall meet the requirements of Specification Section 02741 Paragraph 2.01 D., "Composition of Mixtures", for Mix No. 1, City of Memphis
- D. Asphalt Driveway Pavement: Asphalt driveway pavement shall meet the requirements of Specification Section 02741 Paragraph 2.01 D., "Composition of Mixtures", for Mix No. 2.
- E. Expansion Joint Filler: Preformed expansion joint filler shall be of the bituminous type, shall conform to the requirements of AASHTO M 213 and shall not be more than 1 inch or less than 1/2 inch in thickness. The filler shall be cut to the full depth of pavement, curb and gutter, side walk, or driveway being replaced.
- F. Gravel Pavement or Base: Camden gravel or crushed limestone meeting the requirements of Specification Section 02720 Paragraph 2.01, Aggregates for Gradation No. 1, 2 or 3 ( City of Memphis) shall be used to replace graveled areas disturbed by construction.

#### **2.02 EQUIPMENT**

- A. Equipment and tools necessary for cutting, removal, and hauling of existing items; handling and placement of new material; and all equipment necessary to perform all parts of the Work shall be at the job site sufficiently ahead of the start of construction operations to be examined and approved by the Owner.
- B. When saws are used to cut pavement, the Contractor shall provide sawing equipment adequate in power to complete the sawing to a minimum of 1-1/2 inches below the pavement surface in one pass. An ample supply of saw blades shall be maintained at the site of the Work at all times during sawing operations.
- C. Other types of pavement cutting equipment shall be capable of cutting the pavement to a neat straight line of 1-1/2 inch minimum depth below the pavement surface in one pass.
- D. The Contractor shall provide equipment capable of removal of pavements, sidewalks, driveway aprons, curbs and gutters, driveways, paved areas, and curbs without disturbance of adjacent items to remain in place.
- E. Equipment necessary for the handling, placement, and finishing of concrete shall meet the applicable requirements of Specification Section 02750 Paragraph 2.02, "Portland Cement Concrete Pavement"; Specification Section 02775 Paragraph 2.02, "Portland Cement Concrete Sidewalks and Driveways"; and Specification Section 02770 Paragraph 2.02, "Curb, Curb and Gutter, and Water Table" .
- F. Equipment necessary for the handling, placement, and compaction of asphalt shall meet the requirements of Specification Section 02741 Paragraph 2.02.

## **PART 3 – CONSTRUCTION REQUIREMENTS**

### **3.01 REMOVAL OF ASPHALT PAVEMENT**

Asphalt pavement shall be removed to a clean straight line as detailed on the Plans. Pavement shall be cut by saw or other equipment approved by the Owner in advance. Edges of existing asphalt pavement adjacent to trenches where damaged shall be recut in a clean straight line within the limits of damaged pavement only. Such recuts shall be parallel to the original cuts and perpendicular to the pavement surface.

### **3.02 REMOVAL OF CONCRETE PAVEMENT**

- A. Concrete pavement shall be removed to a neat straight line as detailed on the Plans. Care shall be used to avoid damage to pavements and to the pavement base remaining in place.
- B. Concrete pavement may, at the Contractor's option, be removed by saw cutting to a neat straight line. Saw cuts shall be made to a minimum depth of 1-1/2 inches and at a location to provide a cutback edge in accordance with the Design Standards. The edges of the existing concrete pavement adjacent to trenches where damaged subsequent to saw cutting of pavement shall again be saw cut in a neat straight line to remove the damaged pavement areas. Such saw cuts shall be parallel to the original saw cuts and perpendicular to the pavement surface.

### **3.03 REMOVAL OF CONCRETE SIDEWALK, CURB AND GUTTER, AND DRIVEWAY**

Concrete sidewalks, curbs and gutters, and driveways shall be removed to the nearest contraction or expansion joint. Care shall be used to avoid damage to sidewalks, curbs and gutters, and driveways remaining in place.

**END OF SECTION 02950**

## **SECTION 16010 – BASIC ELECTRICAL REQUIREMENTS**

### **PART 1 - GENERAL**

#### **1.1 WORK INCLUDED**

- A. This section specifies the basic electrical requirements for this project as well as the general requirements which apply to the work of Division 16 in addition to those stipulated in Section 1. Should any discrepancies exist between the requirements of Division 16 and those found in Section 1; the more stringent requirement shall govern except where the two requirements are contradictory in which case the Section 1 requirements shall govern.
- B. The electrical work required for this project consists of furnishing all labor, equipment and materials necessary to obtain complete and operational electrical systems as indicated on the drawings and as specified herein.
- C. The Contractor shall furnish all material and labor as required for the installation of the new electric service per the local power company's requirements. The Contractor shall coordinate with the local power company for all requirements.

#### **1.2 CODES, STANDARDS AND PERMITS:**

- A. The installation shall comply with the following:
  - 1. All applicable local and state wiring ordinances.
  - 2. The National Electrical Code (NFPA-70-2008).
  - 3. All applicable provisions of the Occupational Safety and Health Act (OSHA).
  - 4. Requirements of the power company furnishing services to the project.
  - 5. International Building Code (2009 Edition).
  - 6. Life Safety Code (NFPA 101-2008).
  - 7. Americans with Disabilities Act (ADA).
- B. This contractor shall apply for, obtain, and pay for all permits required. At the conclusion of the installation, he/she shall secure a certificate of inspection, properly signed by the controlling building department, which shall state that all rules have been complied with and that the work is satisfactory.
- C. Should any part of the plans or specifications be found to be in conflict with applicable codes or ordinances, the contractor shall notify the engineer before submitting his/her bid.

#### **1.3 TRADE NAMES AND EQUALS**

- A. Manufacturer's trade names or catalog numbers used in these specifications and indicated on the drawings denote type, size, quality, and design of equipment desired.
- B. Where equipment is specified as "equal", or "approved equal", it shall mean equal in the opinion of the engineer. This contractor is free to offer substitutions for consideration as equal after the contract is



signed; however, he shall be prepared to furnish specified materials where substitutions are not approved.

#### 1.4 DELIVERY, STORAGE, AND HANDLING OF MATERIAL AND EQUIPMENT

- A. The contractor shall be responsible for the purchase, delivery, and storage of all materials and equipment indicated to be supplied under this section of the specifications, and it shall be his/her responsibility to schedule the delivery of materials and equipment at such stages of the work as will permit uninterrupted construction of all phases of the work.
- B. Where owner furnished equipment is to be turned over to this contractor for installation, it shall be the responsibility of this contractor to receive such equipment and store in a safe, dry location.
- C. This contractor shall do all required rigging, hoisting, transporting, etc., of all equipment furnished under this contract, and shall further furnish any additional structural members, as may be required, for the proper support of any and all equipment furnished hereunder.

#### 1.5 USE OF DOCUMENTS:

- A. The scope of the electrical work for this project is not limited to the requirements of any one drawing, any portion of the drawings, any one specification division, or any portion of the specifications whose main theme is electrical. The scope of the electrical work for this project consists of all electrical work required to obtain complete and operating systems and equipment as indicated on or as can be reasonably inferred from all drawings and specifications.
- B. The drawings indicate diagrammatically the general arrangement of circuits and outlets, locations of switches, panelboards, electrically operated equipment & appliances and other work. This data is as accurate as planning can determine, but accuracy is not guaranteed. Field verification of all dimensions, locations, levels, etc., to suit field conditions is directed.
- C. Should any structural or mechanical interferences prevent the installation of conduit, setting of junction boxes and cabinets, arrangement of lighting fixtures and method of suspension, etc., in the locations indicated on the drawings, the necessary deviations therefrom must be made without additional cost to the owner, where relocation is not over five (5) feet from the location shown on the drawings.
- D. Review all drawings and adjust all work to conform to all conditions shown therein. Discrepancies between different drawings, or between drawings and specifications or codes and regulations governing the installation shall be brought to the attention of the Owner's Representative prior to the date of bid opening.
- E. The locations of equipment, motors, etc., as indicated on the drawings are approximate only. Verify all dimensions with the appropriate equipment installer before rough-in. Where conduit, wiring, service equipment, lights, switches, or other electrical equipment interfere with construction; remove, relocate and rearrange such material and equipment as required to make a complete and satisfactory installation.
- F. Any offsets in conduit required or necessary to avoid interferences with structure, or the work of other trades, etc., shall be made at no additional cost to the owner.

## 1.6 COORDINATION

- A. The electrical contractor shall coordinate his/her work with that of other subcontractors on the job and also with that of the owner in order that there be no delay in the proper installation and completion of the several parts of the work.
- B. This contractor shall use every precaution to protect the work of others, and he/she will be held responsible for all damage done by his workers to the work of other trades. He/she shall also protect his work from danger of breakage, dirt, foreign materials, etc., and shall replace all work so damaged.
- C. Coordinate phases of the work with the owner and other trades to allow the owner to continue normal business operations throughout the duration of the project. Any necessary power outages shall be scheduled for other than the owner's hours of operation, or be pre-arranged with the owner.

## 1.7 MANUFACTURER'S RECOMMENDATIONS

- A. Unless specifically indicated otherwise, all equipment and materials shall be installed in accordance with the best recommendation of the manufacturer. A copy of the manufacturer's installation recommendations shall be kept in the job superintendent's office and shall be available to the owner's representative at all times.

## 1.8 CUTTING AND PATCHING

- A. This contractor shall be responsible for all cutting and patching required for the installation of his work, and he/she shall employ workers skilled in the trades required for all cutting and patching work.
- B. This contractor shall be responsible for the proper location of all chases, recesses, and openings required for his work.
- C. This contractor shall provide all sleeves, etc., required for the introduction and placement of his work, and shall be responsible for the correct location of same.
- D. Beams or columns shall not be pierced without permission of the structural engineer, and then only as directed.

## 1.9 PAINTING

- A. Painting of materials and equipment furnished under the electrical portion of the contract, if required, will be done under a separate section of the project specifications. The electrical contractor shall, however, refinish and restore to the original condition and appearance, all electrical equipment which has sustained damage to manufacturer's finish paint.
- B. All electrical equipment shall be provided with factory applied prime and finish paint, unless otherwise specified.

#### 1.10 SHOP DRAWINGS (SUBMITTALS)

- A. Six copies of shop drawings and/or manufacturer's descriptive data of a nature to completely identify the equality of the material or equipment intended for installation shall be submitted for approval before beginning any construction and within thirty days after signing contract. Failure to submit data for approval within thirty days time limit will be construed as meaning equipment called for by name will be furnished. Data shall be organized in same order as listed below, shall be submitted all in one three ring binder, indexed by flysheet on front page, each item tabbed and labeled, arranged in the order they appear in the specifications, and be bound in sets, all sets identical. No exception will be made to this procedure and time schedule.
- B. Each item submitted for review shall have submittal data preceded by a typewritten description (by contractor or item supplier) of the item. Description shall include make and model numbers and shall describe the item. List all options and accessories which are included. List any options or accessories shown on shop drawings which are not included.

#### 1.11 RECORD DRAWINGS

- A. This contractor shall maintain a complete up-to-date set of record drawings and specifications on the job site. Drawings shall be maintained in a neat condition and shall clearly show any changes from original drawings and specifications.
- B. Contractor shall use a designed set of prints of the contract documents, as prepared by the engineer, to mark up for record drawing purposes.
- C. The contractor shall prepare a set of reproducible record drawings. These drawings and a set of specifications shall be turned over to the owner and shall become the property of the owner before final payment will be made.

#### 1.12 MAINTENANCE MANUALS

- A. Contractor shall provide three (3) copies of operational and maintenance manuals for all equipment installed under this division of the specifications. The manuals shall include a list of spare parts and proper operational and maintenance procedures.
- B. The manuals shall be organized and fully indexed. Manuals shall consist of three-ring, hard back binders with appropriate dividers for each part.
- C. Manual contents shall include, but shall not be limited to the following:
  - 1. Name and address of contractor, equipment manufacturer and supplier.
  - 2. Set of approved shop drawings or approved submittal data.
  - 3. Wiring diagrams and installation drawings.
  - 4. Spare parts and replacement parts lists as recommended by the manufacturer.
  - 5. Proper operational procedures and maintenance procedures.

6. Installation and operation manuals.
7. Maintenance and service manuals.
8. Copy of warranties and guarantees.

- D. Operating and maintenance manuals shall be turned over to the owner before final payment will be made.
- E. It shall be the responsibility of this contractor maintain, warrant, clean, etc., any equipment supplied by this contractor until all installation and operating and maintenance manuals are turned over to the owner.

1.13 ELECTRICAL DEMOLITION:

- A. Remove all existing electrical wiring, raceways, junction boxes, fixtures, and devices indicated on the drawings, as specified herein, or as may be required to complete the work.

1.14 SAFETY DEVICES

- A. Electrical equipment and wiring used during construction shall be installed and insulated in a manner to insure the safety of personnel.
- B. Provide suitable guards, signs, etc. to protect personnel from “hot” wiring in panelboards, junction boxes, etc. during the construction period.

1.15 GUARANTEE

- A. The contractor shall guarantee to the owner all work performed under this contract to be free from defects in workmanship and material for a period of one (1) year from date of final acceptance. Defects arising during this period will be promptly remedied by the contractor at his own expense upon notice by the owner. All lamps for lighting fixtures shall be excluded from this guarantee, but one (1) complete and operative set of lamps for lighting fixtures shall be in place at the time of final acceptance.

**END OF SECTION 16010**

## **SECTION 16060 - GROUNDING AND BONDING**

### **PART 1 - GENERAL**

#### **1.1 SUMMARY**

- A. This Section includes methods and materials for grounding systems and equipment.

#### **1.2 SUBMITTALS**

- A. Product Data: For each type of product indicated.
- B. Field quality-control test reports.

#### **1.3 QUALITY ASSURANCE**

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Comply with UL 467 for grounding and bonding materials and equipment.

### **PART 2 - PRODUCTS**

#### **2.1 CONDUCTORS**

- A. Insulated Conductors: Copper wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction.
- B. Bare Copper Conductors:
  - 1. Solid Conductors: ASTM B 3.
  - 2. Stranded Conductors: ASTM B 8.
  - 3. Bonding Conductor: No. 4 or No. 6 AWG, stranded conductor.
  - 4. Bonding Jumper: Copper tape, braided conductors, terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.

#### **2.2 CONNECTORS**

- A. Listed and labeled by a nationally recognized testing laboratory acceptable to authorities having jurisdiction for applications in which used, and for specific types, sizes, and combinations of conductors and other items connected.
- B. Bolted Connectors for Conductors and Pipes: Copper or copper alloy, bolted pressure-type, with at least two bolts.

1. Pipe Connectors: Clamp type, sized for pipe.
- C. Welded Connectors: Exothermic-welding kits of types recommended by kit manufacturer for materials being joined and installation conditions.

## 2.3 GROUNDING ELECTRODES

- A. Ground Rods: Copper-clad steel, sectional type; 3/4 inch by 10 feet in diameter.

## PART 3 - EXECUTION

### 3.1 APPLICATIONS

- A. Conductors: Install solid conductor for No. 8 AWG and smaller, and stranded conductors for No. 6 AWG and larger, unless otherwise indicated.
- B. Conductor Terminations and Connections:
  1. Pipe and Equipment Grounding Conductor Terminations: Bolted connectors.
  2. Underground Connections: Welded connectors, except at test wells and as otherwise indicated.
  3. Connections to Structural Steel: Welded connectors.

### 3.2 EQUIPMENT GROUNDING

- A. Install insulated equipment grounding conductors with the following items, in addition to those required by NFPA 70:
  1. Feeders and branch circuits.
  2. Flexible raceway runs.

### 3.3 INSTALLATION

- A. Grounding Conductors: Route along shortest and straightest paths possible, unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.
- B. Ground Rods: Drive rods until tops are 2 inches below finished floor or final grade, unless otherwise indicated.
  1. Interconnect ground rods with grounding electrode conductor below grade and as otherwise indicated. Make connections without exposing steel or damaging coating, if any.
- C. Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance, except where routed through short lengths of conduit.

1. Bonding to Structure: Bond straps directly to basic structure, taking care not to penetrate any adjacent parts.
2. Bonding to Equipment Mounted on Vibration Isolation Hangers and Supports: Install so vibration is not transmitted to rigidly mounted equipment.
3. Use exothermic-welded connectors for outdoor locations, but if a disconnect-type connection is required, use a bolted clamp.

### 3.4 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections and prepare test reports:
  1. After installing grounding system but before permanent electrical circuits have been energized, test for compliance with requirements.
  2. Test completed grounding system at each location where a maximum ground-resistance level is specified, at service disconnect enclosure grounding terminal.
    - a. Measure ground resistance not less than two full days after last trace of precipitation and without soil being moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance.
    - b. Perform tests by fall-of-potential method according to IEEE 81.
- B. Report measured ground resistances that exceed the following values:
  1. Power and Lighting Equipment or System: 10 ohms.
- C. Excessive Ground Resistance: If resistance to ground exceeds specified values, notify Engineer promptly and include recommendations to reduce ground resistance.

**END OF SECTION 16060**

## **SECTION 16073 - HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS**

### **PART 1 - GENERAL**

#### **1.1 SUMMARY**

- A. Section includes:
  - 1. Hangers and supports for electrical equipment and systems.
  - 2. Construction requirements for concrete bases.

#### **1.2 PERFORMANCE REQUIREMENTS**

- A. Delegated Design: Design supports for multiple raceways, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
- B. Design supports for multiple raceways capable of supporting combined weight of supported systems and its contents.
- C. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.
- D. Rated Strength: Adequate in tension, shear, and pullout force to resist maximum loads calculated or imposed for this Project, with a minimum structural safety factor of five times the applied force.

#### **1.3 SUBMITTALS**

- A. Product Data: For steel slotted support systems.

#### **1.4 QUALITY ASSURANCE**

- A. Comply with NFPA 70.

### **PART 2 - PRODUCTS**

#### **2.1 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS**

- A. Steel Slotted Support Systems: Comply with MFMA-4, factory-fabricated components for field assembly.
  - 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Allied Tube & Conduit.
    - b. Cooper B-Line, Inc.; a division of Cooper Industries.



- c. ERICO International Corporation.
    - d. GS Metals Corp.
    - e. Thomas & Betts Corporation.
    - f. Unistrut; Tyco International, Ltd.
    - g. Wesanco, Inc.
  - 2. Metallic Coatings: Hot-dip galvanized after fabrication and applied according to MFMA-4.
  - 3. Nonmetallic Coatings: Manufacturer's standard PVC, polyurethane, or polyester coating applied according to MFMA-4.
  - 4. Painted Coatings: Manufacturer's standard painted coating applied according to MFMA-4.
  - 5. Channel Dimensions: Selected for applicable load criteria.
- B. Structural Steel for Fabricated Supports and Restraints: ASTM A 36/A 36M, steel plates, shapes, and bars; black and galvanized.
- C. Mounting, Anchoring, and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:
- 1. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened portland cement concrete, steel, or wood, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.
    - a. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - b. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      - 1) Hilti Inc.
      - 2) ITW Ramset/Red Head; a division of Illinois Tool Works, Inc.
      - 3) MKT Fastening, LLC.
      - 4) Simpson Strong-Tie Co., Inc.; Masterset Fastening Systems Unit.
  - 2. Mechanical-Expansion Anchors: Insert-wedge-type, zinc-coated steel, for use in hardened portland cement concrete with tension, shear, and pullout capacities appropriate for supported loads and building materials in which used.
    - a. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
      - 1) Cooper B-Line, Inc.; a division of Cooper Industries.
      - 2) Empire Tool and Manufacturing Co., Inc.
      - 3) Hilti Inc.
      - 4) ITW Ramset/Red Head; a division of Illinois Tool Works, Inc.
      - 5) MKT Fastening, LLC.
  - 3. Concrete Inserts: Steel or malleable-iron, slotted support system units similar to MSS Type 18; complying with MFMA-4 or MSS SP-58.
  - 4. Clamps for Attachment to Steel Structural Elements: MSS SP-58, type suitable for attached structural element.
  - 5. Through Bolts: Structural type, hex head, and high strength. Comply with ASTM A 325.
  - 6. Toggle Bolts: All-steel springhead type.
  - 7. Hanger Rods: Threaded steel.

## 2.2 FABRICATED METAL EQUIPMENT SUPPORT ASSEMBLIES

- A. Description: Welded or bolted, structural-steel shapes, shop or field fabricated to fit dimensions of supported equipment.

## PART 3 - EXECUTION

### 3.1 APPLICATION

- A. Comply with NECA 1 and NECA 101 for application of hangers and supports for electrical equipment and systems except if requirements in this Section are stricter.
  - 1. Secure raceways and cables to these supports with two-bolt conduit clamps.

### 3.2 SUPPORT INSTALLATION

- A. Comply with NECA 1 and NECA 101 for installation requirements except as specified in this Article.
- B. Strength of Support Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lb.
- C. Drill holes for expansion anchors in concrete at locations and to depths that avoid reinforcing bars.

### 3.3 INSTALLATION OF FABRICATED METAL SUPPORTS

- A. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor electrical materials and equipment.
- B. Field Welding: Comply with AWS D1.1/D1.1M.

### 3.4 CONCRETE BASES

- A. Construct concrete bases of dimensions indicated but not less than 4 inches larger in both directions than supported unit, and so anchors will be a minimum of 10 bolt diameters from edge of the base.
- B. Use 3000-psi, 28-day compressive-strength concrete.
- C. Anchor equipment to concrete base.
  - 1. Place and secure anchorage devices. Use supported equipment manufacturer's setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
  - 2. Install anchor bolts to elevations required for proper attachment to supported equipment.
  - 3. Install anchor bolts according to anchor-bolt manufacturer's written instructions.

### 3.5 PAINTING

- A. Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.
  - 1. Apply paint by brush or spray to provide minimum dry film thickness of 2.0 mils.
- B. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

**END OF SECTION 16073**

## **SECTION 16075 - ELECTRICAL IDENTIFICATION**

### **PART 1 - GENERAL**

#### **1.1 SUMMARY**

- A. Section Includes:
  - 1. Identification for conductors.
  - 2. Underground-line warning tape.
  - 3. Warning labels and signs.
  - 4. Equipment identification labels.
  - 5. Miscellaneous identification products.

#### **1.2 SUBMITTALS**

- A. Product Data: For each electrical identification product indicated.

#### **1.3 QUALITY ASSURANCE**

- A. Comply with ANSI A13.1.
- B. Comply with NFPA 70.
- C. Comply with 29 CFR 1910.144 and 29 CFR 1910.145.
- D. Comply with ANSI Z535.4 for safety signs and labels.
- E. Adhesive-attached labeling materials, including label stocks, laminating adhesives, and inks used by label printers, shall comply with UL 969.

### **PART 2 - PRODUCTS**

#### **2.1 CONDUCTOR IDENTIFICATION MATERIALS**

- A. Color-Coding Conductor Tape: Colored, self-adhesive vinyl tape not less than 3 mils thick by 1 to 2 inches wide.

#### **2.2 UNDERGROUND-LINE WARNING TAPE**

- A. Tape:
  - 1. Recommended by manufacturer for the method of installation and suitable to identify and locate underground electrical utility lines.
  - 2. Printing on tape shall be permanent and shall not be damaged by burial operations.

3. Tape material and ink shall be chemically inert, and not subject to degrading when exposed to acids, alkalis, and other destructive substances commonly found in soils.

B. Color and Printing:

1. Comply with ANSI Z535.1 through ANSI Z535.5.

## 2.3 EQUIPMENT IDENTIFICATION LABELS

- A. Adhesive Film Label with Clear Protective Overlay: Machine printed, in black, by thermal transfer or equivalent process. Minimum letter height shall be 3/8 inch. Overlay shall provide a weatherproof and UV-resistant seal for label.
- B. Self-Adhesive, Engraved, Laminated Acrylic or Melamine Label: Adhesive backed, with white letters on a dark-gray background. Minimum letter height shall be 3/8 inch.

## 2.4 MISCELLANEOUS IDENTIFICATION PRODUCTS

- A. Fasteners for Labels and Signs: Self-tapping, stainless-steel screws or stainless-steel machine screws with nuts and flat and lock washers.

# PART 3 - EXECUTION

## 3.1 INSTALLATION

- A. Location: Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment.
- B. Apply identification devices to surfaces that require finish after completing finish work.
- C. Self-Adhesive Identification Products: Clean surfaces before application, using materials and methods recommended by manufacturer of identification device.
- D. Attach signs and plastic labels that are not self-adhesive type with mechanical fasteners appropriate to the location and substrate.
- E. System Identification Color-Coding Bands for Raceways and Cables: Each color-coding band shall completely encircle cable or conduit. Place adjacent bands of two-color markings in contact, side by side. Locate bands at changes in direction, at penetrations of walls and floors, at 50-foot maximum intervals in straight runs, and at 25-foot maximum intervals in congested areas.

## 3.2 IDENTIFICATION SCHEDULE

- A. Power-Circuit Conductor Identification, 600 V or Less: For conductors in vaults, pull and junction boxes, manholes, and handholes, use color-coding conductor tape to identify the phase.

1. Color-Coding for Phase and Voltage Level Identification, 600 V or Less: Use colors listed below for ungrounded service, feeder and branch-circuit conductors.
  - a. Color shall be factory applied or field applied for sizes larger than No. 8 AWG, if authorities having jurisdiction permit.
  - b. Colors for 208/120-V Circuits:
    - 1) Phase A: Black.
    - 2) Phase B: Red.
    - 3) Phase C: Blue.
  - c. Colors for 480/277-V Circuits:
    - 1) Phase A: Brown.
    - 2) Phase B: Orange.
    - 3) Phase C: Yellow.
  - d. Field-Applied, Color-Coding Conductor Tape: Apply in half-lapped turns for a minimum distance of 6 inches from terminal points and in boxes where splices or taps are made. Apply last two turns of tape with no tension to prevent possible unwinding. Locate bands to avoid obscuring factory cable markings.
- B. Locations of Underground Lines: Identify with underground-line warning tape for power, lighting, communication, and control wiring and optical fiber cable.
  1. Install underground-line warning tape for both direct-buried cables and cables in raceway.
- C. Equipment Identification Labels: On each unit of equipment, install unique designation label that is consistent with wiring diagrams, schedules, and the Operation and Maintenance Manual. Apply labels to disconnect switches and protection equipment, central or master units, control panels, control stations, terminal cabinets, and racks of each system. Systems include power, lighting, control, communication, signal, monitoring, and alarm systems unless equipment is provided with its own identification.
  1. Labeling Instructions:
    - a. Indoor Equipment: Adhesive film label. Unless otherwise indicated, provide a single line of text with 1/2-inch- high letters on 1-1/2-inch- high label; where two lines of text are required, use labels 2 inches high.
    - b. Outdoor Equipment: Engraved, laminated acrylic or melamine label..
    - c. Unless provided with self-adhesive means of attachment, fasten labels with appropriate mechanical fasteners that do not change the NEMA or NRTL rating of the enclosure.

**END OF SECTION 16075**

## **SECTION 16120 - CONDUCTORS AND CABLES**

### **PART 1 - GENERAL**

#### **1.1 SUMMARY**

- A. This Section includes the following:
  - 1. Building wires and cables rated 600 V and less.
  - 2. Connectors, splices, and terminations rated 600 V and less.

#### **1.2 SUBMITTALS**

- A. Product Data: For each type of product indicated.
- B. Field quality-control test reports.

#### **1.3 QUALITY ASSURANCE**

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Comply with NFPA 70.

### **PART 2 - PRODUCTS**

#### **2.1 CONDUCTORS AND CABLES**

- A. Copper Conductors: Comply with NEMA WC 70.
- B. Conductor Insulation: Comply with NEMA WC 70 for Types THHN-THWN.
- C. Multiconductor Cable: Comply with NEMA WC 70/ICEA S-95-658 for metal-clad cable, Type MC with ground wire.
- D. All conductors shall be copper.

#### **2.2 CONNECTORS AND SPLICES**

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - 1. AFC Cable Systems, Inc.
  - 2. Hubbell Power Systems, Inc.

3. O-Z/Gedney; EGS Electrical Group LLC.
  4. 3M; Electrical Products Division.
  5. Tyco Electronics Corp.
- B. Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated.

## PART 3 - EXECUTION

### 3.1 CONDUCTOR MATERIAL APPLICATIONS

- A. Feeders: Copper. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.
- B. Branch Circuits: Copper. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.

### 3.2 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS

- A. Exposed Feeders: Type THHN-THWN, single conductors in raceway.
- B. Feeders Concealed in Ceilings, Walls, Partitions, and Crawlspace: Type THHN-2-THWN-2, single conductors in raceway or Metal-clad cable, Type MC.
- C. Feeders Concealed in Concrete, below Slabs-on-Grade, and Underground: Type THHN-2-THWN-2, single conductors in raceway.
- D. Exposed Branch Circuits, Including in Crawlspace: Type THHN-2-THWN-2, single conductors in raceway.
- E. Class 1 Control Circuits: Type THHN-THWN, in raceway.
- F. Class 2 Control Circuits: Type THHN-THWN, in raceway.

### 3.3 INSTALLATION OF CONDUCTORS AND CABLES

- A. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.
- B. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.
- C. Support cables according to Division 16 Section "Hangers and Supports for Electrical Systems."
- D. Identify and color-code conductors and cables according to Division 16 Section "Electrical Identification."



- E. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.
- F. Make splices and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.

### 3.4 FIELD QUALITY CONTROL

- A. Perform tests and inspections and prepare test reports.
- B. Tests and Inspections:
  - 1. After installing conductors and cables and before electrical circuitry has been energized, test service entrance and feeder conductors for compliance with requirements.
  - 2. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
- C. Remove and replace malfunctioning units and retest as specified above.

**END OF SECTION 16120**

## **SECTION 16130 - RACEWAYS AND BOXES**

### **PART 1 - GENERAL**

#### **1.1 SUMMARY**

- A. This Section includes raceways, fittings, boxes, enclosures, and cabinets for electrical wiring.

#### **1.2 SUBMITTALS**

- A. Product Data: For raceways, and fittings.

#### **1.3 QUALITY ASSURANCE**

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Comply with NFPA 70.

### **PART 2 - PRODUCTS**

#### **2.1 METAL CONDUIT AND TUBING**

- A. Rigid Steel Conduit: ANSI C80.1.
- B. IMC: ANSI C80.6.
- C. EMT: ANSI C80.3.
- D. FMC: Zinc-coated steel.
- E. RNC: Type EPC-40-PVC, complying with NEMA TC 2 and UL 651 unless otherwise indicated.
- F. LFMC: Flexible steel conduit with PVC jacket.
- G. Fittings for Conduit (Including all Types and Flexible and Liquidtight), EMT, and Cable: NEMA FB 1; listed for type and size raceway with which used, and for application and environment in which installed.
  - 1. Fittings for EMT: Steel or die-cast, set-screw or compression type.

#### **2.2 NONMETALLIC CONDUIT AND TUBING**

- A. RNC: NEMA TC 2, Type EPC-40-PVC, unless otherwise indicated.

- B. LFNC: UL 1660.
- C. Continuous HDPE: Comply with UL 651B.
- D. Fittings for RNC: NEMA TC 3; match to conduit or tubing type and material.

## PART 3 - EXECUTION

### 3.1 RACEWAY APPLICATION

- A. Outdoors: Apply raceway products as specified below, unless otherwise indicated:
  - 1. Exposed Conduit: Rigid steel conduit.
  - 2. Concealed Conduit, Aboveground: Rigid steel conduit.
  - 3. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC.
  - 4. Boxes and Enclosures, Aboveground: NEMA 250, Type 3R.
  - 5. Underground Conduit: Direction bore beneath existing pavement. Trenching allowed in grass areas of the site.
- B. Minimum Raceway Size: 1/2-inch trade size.
- C. Raceway Fittings: Compatible with raceways and suitable for use and location.
  - 1. Rigid Steel Conduit: Use threaded rigid steel conduit fittings, unless otherwise indicated.

### 3.2 INSTALLATION

- A. Comply with NECA 1 for installation requirements applicable to products specified in Part 2 except where requirements on Drawings or in this Article are stricter.
- B. Complete raceway installation before starting conductor installation.
- C. Support raceways as specified in Division 16 Section "Electrical Supports and Seismic Restraints."
- D. Arrange stub-ups so curved portions of bends are not visible above the finished slab.
- E. Install no more than the equivalent of three 90-degree bends in any conduit run except for communications conduits, for which fewer bends are allowed.
- F. Raceway Terminations at Locations Subject to Moisture or Vibration: Use insulating bushings to protect conductors, including conductors smaller than No. 4 AWG.
- G. Flexible Conduit Connections: Use maximum of 72 inches of flexible conduit for equipment subject to vibration, noise transmission, or movement; and for transformers and motors.
  - 1. Use LFMC in damp or wet locations subject to severe physical damage.

- H. Directional Boring.
1. Record depths every 10 feet over drill head while drilling.
  2. Final hole shall be no more than 1.5 times larger than the conduit being pulled and shall not exceed the products maximum tension allowed.
  3. Clean all mud from drill system.
  4. Bentonite should be used if any sand is present.
  5. All utilities should be marked prior to construction.

### 3.3 BOXES, ENCLOSURES, AND CABINETS

- A. Manufacturers: Subject to compliance with requirements, provide products by the following:
1. Cooper Technologies Company; Cooper Crouse-Hinds.
  2. EGS/Appleton Electric.
  3. Erickson Electrical Equipment Company.
  4. FSR Inc.
  5. Hoffman.
  6. Hubbell Incorporated.
  7. Milbank Manufacturing Co.
  8. Mono-Systems, Inc.
  9. O-Z/Gedney.
  10. RACO; Hubbell.
  11. Robroy Industries.
  12. Spring City Electrical Manufacturing Company.
  13. Stahlin Non-Metallic Enclosures.
  14. Thomas & Betts Corporation.
  15. Wiremold / Legrand.
- B. General Requirements for Boxes, Enclosures, and Cabinets: Boxes, enclosures, and cabinets installed in wet locations shall be listed for use in wet locations.
- C. Sheet Metal Outlet and Device Boxes: Comply with NEMA OS 1 and UL 514A.
- D. Cast-Metal Outlet and Device Boxes: Comply with NEMA FB 1, aluminum, Type FD, with gasketed cover.
- E. Nonmetallic Outlet and Device Boxes: Comply with NEMA OS 2 and UL 514C.
- F. Luminaire Outlet Boxes: Nonadjustable, designed for attachment of luminaire weighing 50 lb (23 kg). Outlet boxes designed for attachment of luminaires weighing more than 50 lb (23 kg) shall be listed and marked for the maximum allowable weight.
- G. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.
- H. Box extensions used to accommodate new building finishes shall be of same material as recessed box.

### END OF SECTION 16130

## **SECTION 16410 - ENCLOSED SWITCHES AND CIRCUIT BREAKERS**

### **PART 1 - GENERAL**

#### **1.1 SUMMARY**

**A. Section Includes:**

1. Fusible switches.
2. Nonfusible switches.
3. Molded-case circuit breakers (MCCBs).
4. Enclosures.

#### **1.2 DEFINITIONS**

- A. NC: Normally closed.
- B. NO: Normally open.
- C. SPDT: Single pole, double throw.

#### **1.3 PERFORMANCE REQUIREMENTS**

- A. Seismic Performance: Enclosed switches and circuit breakers shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.
1. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified."

#### **1.4 SUBMITTALS**

- A. Product Data: For each type of enclosed switch, circuit breaker, accessory, and component indicated.
- B. Seismic Qualification Certificates: For enclosed switches and circuit breakers, accessories, and components, from manufacturer.
- C. Operation and maintenance data.

#### **1.5 QUALITY ASSURANCE**

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Comply with NFPA 70.

## PART 2 - PRODUCTS

### 2.1 FUSIBLE SWITCHES

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - 1. Eaton Electrical Inc.; Cutler-Hammer Business Unit.
  - 2. General Electric Company; GE Consumer & Industrial - Electrical Distribution.
  - 3. Siemens Energy & Automation, Inc.
  - 4. Square D; a brand of Schneider Electric.
- B. Type HD, Heavy Duty, Single Throw, 600-V ac, 1200 A and Smaller: UL 98 and NEMA KS 1, horsepower rated, with clips or bolt pads to accommodate indicated fuses, lockable handle with capability to accept three padlocks, and interlocked with cover in closed position.
- C. Accessories:
  - 1. Equipment Ground Kit: Internally mounted and labeled for copper and aluminum ground conductors.
  - 2. Neutral Kit: Internally mounted; insulated, capable of being grounded and bonded; labeled for copper and aluminum neutral conductors.
  - 3. Lugs: Suitable for number, size, and conductor material.

### 2.2 NONFUSIBLE SWITCHES

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - 1. Eaton Electrical Inc.; Cutler-Hammer Business Unit.
  - 2. General Electric Company; GE Consumer & Industrial - Electrical Distribution.
  - 3. Siemens Energy & Automation, Inc.
  - 4. Square D; a brand of Schneider Electric.
- B. Type HD, Heavy Duty, Single Throw, 600-V ac, 1200 A and Smaller: UL 98 and NEMA KS 1, horsepower rated, lockable handle with capability to accept three padlocks, and interlocked with cover in closed position.
- C. Accessories:
  - 1. Equipment Ground Kit: Internally mounted and labeled for copper and aluminum ground conductors.
  - 2. Neutral Kit: Internally mounted; insulated, capable of being grounded and bonded; labeled for copper and aluminum neutral conductors.
  - 3. Lugs: Suitable for number, size, and conductor material.

## 2.3 MOLDED-CASE CIRCUIT BREAKERS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - 1. Eaton Electrical Inc.; Cutler-Hammer Business Unit.
  - 2. General Electric Company; GE Consumer & Industrial - Electrical Distribution.
  - 3. Siemens Energy & Automation, Inc.
  - 4. Square D; a brand of Schneider Electric.
- B. General Requirements: Comply with UL 489, NEMA AB 1, and NEMA AB 3, with interrupting capacity to comply with available fault currents.
- C. Thermal-Magnetic Circuit Breakers: Inverse time-current element for low-level overloads and instantaneous magnetic trip element for short circuits. Adjustable magnetic trip setting for circuit-breaker frame sizes 250 A and larger.
- D. Features and Accessories:
  - 1. Standard frame sizes, trip ratings, and number of poles.
  - 2. Lugs: Suitable for number, size, trip ratings, and conductor material.

## 2.4 ENCLOSURES

- A. Enclosed Switches and Circuit Breakers: NEMA AB 1, NEMA KS 1, NEMA 250, and UL 50, to comply with environmental conditions at installed location.
  - 1. Outdoor Locations: NEMA 250, Type 3R.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Install individual wall-mounted switches and circuit breakers with tops at uniform height unless otherwise indicated.
- B. Comply with mounting and anchoring requirements specified in Division 16 Section "Hangers and Supports for Electrical Systems."
- C. Install fuses in fusible devices.
- D. Comply with NECA 1.

### 3.2 IDENTIFICATION

- A. Comply with requirements in Division 16 Section "Electrical Identification."

1. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs.
2. Label each enclosure with engraved metal or laminated-plastic nameplate.

### 3.3 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
- B. Acceptance Testing Preparation:
  1. Test insulation resistance for each enclosed switch and circuit breaker, component, connecting supply, feeder, and control circuit.
  2. Test continuity of each circuit.
- C. Enclosed switches and circuit breakers will be considered defective if they do not pass tests and inspections.

**END OF SECTION 16410**



## **SECTION 16521 - EXTERIOR LIGHTING**

### **PART 1 - GENERAL**

#### **1.1 SUMMARY**

##### **A. Section Includes:**

1. Exterior luminaires with lamps and ballasts.
2. Luminaire-mounted photoelectric relays.
3. Poles and accessories.

#### **1.2 STRUCTURAL ANALYSIS CRITERIA FOR POLE SELECTION**

- A. Dead Load: Weight of luminaire and its horizontal and vertical supports, lowering devices, and supporting structure, applied as stated in AASHTO LTS-4-M.
- B. Live Load: Single load of 500 lbf (2224 N), distributed as stated in AASHTO LTS-4-M.
- C. Ice Load: Load of 3 lbf/sq. ft. (145 Pa), applied as stated in AASHTO LTS-4-M Ice Load Map.
- D. Wind Load: Pressure of wind on pole and luminaire and banners and banner arms, calculated and applied as stated in AASHTO LTS-4-M.

#### **1.3 ACTION SUBMITTALS**

- A. Product Data: For each luminaire, pole, and support component, arranged in order of lighting unit designation. Include data on features, accessories, and finishes.
- B. Shop Drawings: Anchor-bolt templates keyed to specific poles and certified by manufacturer.

#### **1.4 QUALITY ASSURANCE**

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Comply with IEEE C2, "National Electrical Safety Code."
- C. Comply with NFPA 70.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, product(s) indicated on Drawings.

### 2.2 GENERAL REQUIREMENTS FOR LUMINAIRES

- A. Luminaires shall comply with UL 1598 and be listed and labeled for installation in wet locations by an NRTL acceptable to authorities having jurisdiction.
  - 1. LER Tests Incandescent Fixtures: Where LER is specified, test according to NEMA LE 5A.
  - 2. LER Tests HID Fixtures: Where LER is specified, test according to NEMA LE 5B.
- B. Lateral Light Distribution Patterns: Comply with IESNA RP-8 for parameters of lateral light distribution patterns indicated for luminaires.
- C. Metal Parts: Free of burrs and sharp corners and edges.
- D. Sheet Metal Components: Corrosion-resistant aluminum unless otherwise indicated. Form and support to prevent warping and sagging.
- E. Housings: Rigidly formed, weather- and light-tight enclosures that will not warp, sag, or deform in use. Provide filter/breather for enclosed luminaires.
- F. Doors, Frames, and Other Internal Access: Smooth operating, free of light leakage under operating conditions, and designed to permit relamping without use of tools. Designed to prevent doors, frames, lenses, diffusers, and other components from falling accidentally during relamping and when secured in operating position. Doors shall be removable for cleaning or replacing lenses. Designed to disconnect ballast when door opens.
- G. Plastic Parts: High resistance to yellowing and other changes due to aging, exposure to heat, and UV radiation.
- H. Light Shields: Metal baffles, factory installed and field adjustable, arranged to block light distribution to indicated portion of normally illuminated area or field.
- I. Reflecting surfaces shall have minimum reflectance as follows unless otherwise indicated:
  - 1. White Surfaces: 85 percent.
  - 2. Specular Surfaces: 83 percent.
  - 3. Diffusing Specular Surfaces: 75 percent.
- J. Lenses and Refractors Gaskets: Use heat- and aging-resistant resilient gaskets to seal and cushion lenses and refractors in luminaire doors.

- K. Luminaire Finish: Manufacturer's standard paint applied to factory-assembled and -tested luminaire before shipping. Where indicated, match finish process and color of pole or support materials.
- L. Factory-Applied Finish for Steel Luminaires: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
1. Surface Preparation: Clean surfaces to comply with SSPC-SP 1, "Solvent Cleaning," to remove dirt, oil, grease, and other contaminants that could impair paint bond. Grind welds and polish surfaces to a smooth, even finish. Remove mill scale and rust, if present, from uncoated steel, complying with SSPC-SP 5/NACE No. 1, "White Metal Blast Cleaning," or SSPC-SP 8, "Pickling."
  2. Exterior Surfaces: Manufacturer's standard finish consisting of one or more coats of primer and two finish coats of high-gloss, high-build polyurethane enamel.
- M. Factory-Applied Finish for Aluminum Luminaires: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
1. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.
  2. Natural Satin Finish: Provide fine, directional, medium satin polish (AA-M32); buff complying with AA-M20; and seal aluminum surfaces with clear, hard-coat wax.
  3. Class I, Clear Anodic Finish: AA-M32C22A41 (Mechanical Finish: medium satin; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class I, clear coating 0.018 mm or thicker) complying with AAMA 611.
  4. Class I, Color Anodic Finish: AA-M32C22A42/A44 (Mechanical Finish: medium satin; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class I, integrally colored or electrolytically deposited color coating 0.018 mm or thicker) complying with AAMA 611.
    - a. Color: Dark bronze.
- N. Factory-Applied Labels: Comply with UL 1598. Include recommended lamps and ballasts. Labels shall be located where they will be readily visible to service personnel, but not seen from normal viewing angles when lamps are in place.
1. Label shall include the following lamp and ballast characteristics:
    - a. "USES ONLY" and include specific lamp type.
    - b. Lamp tube configuration (twin, quad, triple), base type, and nominal wattage for compact fluorescent luminaires.
    - c. Lamp type, wattage, bulb type (ED17, BD56, etc.) and coating (clear or coated) for HID luminaires.
    - d. Start type (preheat, rapid start, instant start) compact fluorescent luminaires.
    - e. ANSI ballast type (M98, M57, etc.) for HID luminaires.
    - f. CCT and CRI for all luminaires.

## 2.3 GENERAL REQUIREMENTS FOR POLES AND SUPPORT COMPONENTS

- A. Structural Characteristics: Comply with AASHTO LTS-4-M.
  - 1. Wind-Load Strength of Poles: Adequate at indicated heights above grade without failure, permanent deflection, or whipping in steady winds of speed indicated in "Structural Analysis Criteria for Pole Selection" Article.
  - 2. Strength Analysis: For each pole, multiply the actual equivalent projected area of luminaires and brackets by a factor of 1.1 to obtain the equivalent projected area to be used in pole selection strength analysis.
- B. Luminaire Attachment Provisions: Comply with luminaire manufacturers' mounting requirements. Use stainless-steel fasteners and mounting bolts unless otherwise indicated.
- C. Mountings, Fasteners, and Appurtenances: Corrosion-resistant items compatible with support components.
  - 1. Materials: Shall not cause galvanic action at contact points.
  - 2. Anchor Bolts, Leveling Nuts, Bolt Caps, and Washers: Hot-dip galvanized after fabrication unless otherwise indicated.
  - 3. Anchor-Bolt Template: Plywood or steel.
- D. Handhole: Oval-shaped, with minimum clear opening of 2-1/2 by 5 inches (65 by 130 mm), with cover secured by stainless-steel captive screws.
- E. Concrete Pole Foundations: Cast in place, with anchor bolts to match pole-base flange. Concrete, reinforcement, and formwork are specified on drawings.

## 2.4 STEEL POLES

- A. Poles: Comply with ASTM A 500, Grade B, carbon steel with a minimum yield of 46,000 psig (317 MPa); one-piece construction up to 40 feet (12 m) in height with access handhole in pole wall.
  - 1. Shape: Square, straight.
  - 2. Mounting Provisions: Butt flange for bolted mounting on foundation or breakaway support.
- B. Steel Mast Arms: Single-arm type, continuously welded to pole attachment plate. Material and finish same as pole.
- C. Brackets for Luminaires: Detachable, cantilever, without underbrace.
  - 1. Adapter fitting welded to pole, allowing the bracket to be bolted to the pole mounted adapter, then bolted together with stainless-steel bolts.
  - 2. Cross Section: Tapered oval, with straight tubular end section to accommodate luminaire.
  - 3. Match pole material and finish.
- D. Pole-Top Tenons: Fabricated to support luminaire or luminaires and brackets indicated, and securely fastened to pole top.

- E. Steps: Fixed steel, with nonslip treads, positioned for 15-inch (381-mm) vertical spacing, alternating on opposite sides of pole; first step at elevation 10 feet (3 m) above finished grade.
- F. Grounding and Bonding Lugs: Welded 1/2-inch (13-mm) threaded lug, complying with requirements in Section 16060 "Grounding and Bonding," listed for attaching grounding and bonding conductors of type and size listed in that Section, and accessible through handhole.
- G. Cable Support Grip: Wire-mesh type with rotating attachment eye, sized for diameter of cable and rated for a minimum load equal to weight of supported cable times a 5.0 safety factor.
- H. Prime-Coat Finish: Manufacturer's standard prime-coat finish ready for field painting.
- I. Galvanized Finish: After fabrication, hot-dip galvanize complying with ASTM A 123/A 123M.
- J. Factory-Painted Finish: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
  - 1. Surface Preparation: Clean surfaces to comply with SSPC-SP 1, "Solvent Cleaning," to remove dirt, oil, grease, and other contaminants that could impair paint bond. Grind welds and polish surfaces to a smooth, even finish. Remove mill scale and rust, if present, from uncoated steel, complying with SSPC-SP 5/NACE No. 1, "White Metal Blast Cleaning," or with SSPC-SP 8, "Pickling."
  - 2. Interior Surfaces of Pole: One coat of bituminous paint, or otherwise treat for equal corrosion protection.
  - 3. Exterior Surfaces: Manufacturer's standard finish consisting of one or more coats of primer and two finish coats of high-gloss, high-build polyurethane enamel.
    - a. Color: **[As indicated by manufacturer's designations] [Match Architect's sample] [As selected by Architect from manufacturer's full range].**

## 2.5 POLE ACCESSORIES

- A. Duplex Receptacle: 120 V, 20 A in a weatherproof assembly complying with Section 16140 "Wiring Devices" for ground-fault circuit-interrupter type.
  - 1. **[Surface mounted] [Recessed], [12 inches (300 mm)] <Insert dimension>** above finished grade.
  - 2. Nonmetallic polycarbonate plastic or reinforced fiberglass, weatherproof in use, cover, **<Insert color to match pole,>** that when mounted results in NEMA 250, **[Type 3R] [Type 4X]** enclosure.
  - 3. With cord opening.
  - 4. With lockable hasp and latch that complies with OSHA lockout and tag-out requirements.
- B. Minimum 1800-W transformer, protected by replaceable fuses, mounted behind access cover.
- C. Base Covers: Manufacturers' standard metal units, arranged to cover pole's mounting bolts and nuts. Finish same as pole.

## PART 3 - EXECUTION

### 3.1 LUMINAIRE INSTALLATION

- A. Install lamps in each luminaire.
- B. Fasten luminaire to indicated structural supports.
  - 1. Use fastening methods and materials selected to resist seismic forces defined for the application and approved by manufacturer.
- C. Adjust luminaires that require field adjustment or aiming.

### 3.2 POLE INSTALLATION

- A. Alignment: Align pole foundations and poles for optimum directional alignment of luminaires and their mounting provisions on the pole.
- B. Concrete Pole Foundations: Set anchor bolts according to anchor-bolt templates furnished by pole manufacturer. Concrete materials, installation, and finishing requirements are specified in Section 03300 "Cast-in-Place Concrete."
- C. Foundation-Mounted Poles: Mount pole with leveling nuts, and tighten top nuts to torque level recommended by pole manufacturer.
  - 1. Use anchor bolts and nuts selected to resist seismic forces defined for the application and approved by manufacturer.
  - 2. Grout void between pole base and foundation. Use nonshrink or expanding concrete grout firmly packed to fill space.
  - 3. Install base covers unless otherwise indicated.
  - 4. Use a short piece of 1/2-inch- (13-mm-) diameter pipe to make a drain hole through grout. Arrange to drain condensation from interior of pole.

### 3.3 CORROSION PREVENTION

- A. Aluminum: Do not use in contact with earth or concrete. When in direct contact with a dissimilar metal, protect aluminum by insulating fittings or treatment.
- B. Steel Conduits: Comply with Section 16130 "Raceways and Boxes." In concrete foundations, wrap conduit with 0.010-inch- (0.254-mm-) thick, pipe-wrapping plastic tape applied with a 50 percent overlap.

### 3.4 GROUNDING

- A. Ground metal poles and support structures according to Section 16060 "Grounding and Bonding."

B. Ground nonmetallic poles and support structures according to Section 16060 "Grounding and Bonding."

1. Install grounding electrode for each pole.
2. Install grounding conductor and conductor protector.
3. Ground metallic components of pole accessories and foundations.

**END OF SECTION 16521**